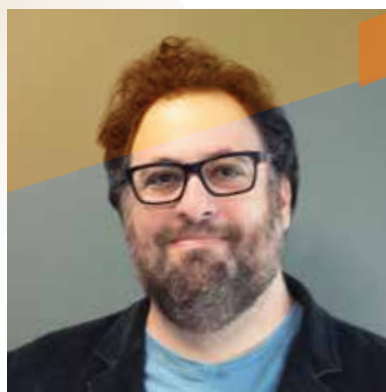
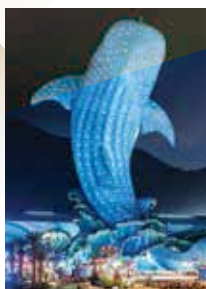


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Also in this issue

- Ten AV technologies transforming the attractions industry
- Reports from DEAL, ISE and the TEA Summit/Theas
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审视自我，迈向世界

作者：Martin Palicki

Think locally, act globally
Martin Palicki,
IPM publisher



本期内容关注故事方面，很容易得出几个结论。首先，行业正处于良性发展并持续增长状态。但可能更重要的是，感觉有点摇摆的市场似乎更加稳定。世界一直变化多端，但是和我们行业息息相关的特定区域，地继续推动着休闲和娱乐花费。此外，还有其他经济体（特别是俄罗斯，印度和中东地区）正在为新的机遇潮做好准备。

其次，很显然北美和欧洲在这个行业处于领导地位的时代正在发生变化。DEAL会议和2019 TEA Thea颁奖名单都证明了，亚洲的供应商和领导者正在改变这种范式，并且他们的能力似乎在不断提升。

这可能会给已成立的西方公司带来担忧，但我建议重新使用一句流行的说法，作为保持相关性的指南：“审视自我，迈向世界”。审视自我是指审度自省，准确认识自己的核心业务和利益。一旦清楚自己为市场所创造的独特价值，你就要将其带向全世界。换句话说，就是迈向世界。

很多在中国和亚洲其他地区投入了时间和资本建立业务的公司，将继续从这一既定的品牌中获益。毕竟，即使现在有数十种替代产品，但是人们还是倾向于买可口可乐和百事可乐。对于那些名字不够响亮和辨识度不高的，国际合作仍是在海外建立客户关系和声誉的理想方式。

由您决定是否走出来，确保人们知道您是谁，做过什么。为此，InPark可以为您提供帮助。我们全球的读者在持续增长，因为我们将更多的文章翻译成中文，同时我们的全球发行点也在增长。

世界可能在变，但并没有变小。如果您还没有开始，那现在是时候启动您的全球战略计划：审查·计划·参与。

Looking at stories in this issue, it's easy to draw a couple of conclusions. First, the industry is in a good spot. Growth continues to be positive, but perhaps more importantly, markets that perhaps felt a bit questionable appear more stable. There will always be volatility in the world, but the particular regions most relevant to our industry seem reliably poised to continue driving leisure and entertainment spending. Further, there are additional economies (especially in Russia, India and the Middle East) that are gearing up for new waves of opportunity.

Second, it's also clear that the era of North American and European leadership in this industry is changing. As evidenced at both the DEAL conference and in the slate of 2019 TEA Thea Awards, suppliers and leaders in Asia are changing the paradigm, and their capabilities appear to be ever-expanding.

This might be concerning to established Western companies, but I suggest reinventing a popular saying as a guide for staying relevant: “think locally, act globally.” Thinking locally asks you to look inward and examine exactly what your core business and benefits are. Once you understand the unique value that you bring to the marketplace, take it out into the world. In other words: act globally.

Many who invested time and capital in building operations in China and elsewhere in Asia will continue to reap the benefits of that established branding. After all, people still tend to buy Coke and Pepsi even when dozens of alternatives are available. And for those without that name recognition, international partnerships remain an ideal method for building clientele and reputation overseas.

It's up to you to get out there and make sure you are visible, present and understood. Towards that end, InPark can help. Our global audience continues to grow as we translate more content into Mandarin, and our international distribution outlets increase.

The world may be changing, but it isn't shrinking. If you haven't already, now is the time to execute your global strategy: Examine. Plan. Engage.





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总体规划师，首席设计师，娱乐和景点设计师

身临其境：沉浸式故事体验

作者：Judith Rubin

在游客景点领域，技术已经发展到一定程度，结合现实和虚拟，支持营造更生动和真实的叙事环境。我们比以往任何时候更感觉像是身处于星际迷航的全息甲板之上。复杂性和性能与承受力和可及性的结合，为创意团队和营运人员在选择叙事工具，设计和构建使人身临其境的动人体验、创建世外桃源等带来了更多选择，减少了障碍。

行业将会继续创造更多可以带来身临其境体验的世界，这也是他们应该做的。我们行业现在可以无限制提供深度沉浸式体验和空间——独特的户外共享冒险。最有潜力的（且最具有创造性挑战的）是游客在其中拥有可以选择并做出会影响故事后续发展行动的权力。

非线性，能唤起情感连接的沉浸体验不只是玩游戏。通过物理门户进入游戏，会产生实时结果和不同的结局。每次都是不同的故事，缘于你的决定和行动，同时其他游客的决定和行动都将影响接下来的剧情发展。这种独特且有竞争力的产品将为户外休闲目的地带来流量和重复参与量。

沉浸的、互动的、实时的且有应答的空间可提供将爆炸性IP带入生活的独特平台。或者，它可能是原始艺术表达的载体，或者传达某一历史时刻，或者分享一个民间故事，或者科学探索……或者是很多其他的冒险。重要的是，这种流畅的叙事方式和带来的游客体验已经成为了我们行业的引领和追求。您将如何利用它来成就您的下一个项目，使其引人注目且无法抗拒呢？



Joe Kleiman is News Editor for the InPark website. He has 25+ years management experience: in tourism, museums and attractions, in the giant screen industries and as a zookeeper.

COVER: The Producers Group takes advantage of an experienced team of leaders, along with an esteemed collection of industry advisors, to help bring attraction and entertainment ideas to reality. We look at their approach and hear from voices across the company.

Full story on p. 22

Deep inside the story bubble

Judith Rubin,
IPM editor



In visitor attractions, technology has reached a stage where it can support the creation of storytelling environments that are ever more vivid and authentic, joining reality to virtuality. We're closer than ever to something that feels like being on the Star Trek Holodeck. Sophistication and performance are coupled with affordability and accessibility, giving creatives and operators more options and fewer barriers than ever before in terms of storytelling tools and the ability to design and build immersive, engaging experiences and out-of-this-world worlds.

Build them they will. And build them they must. Without qualification, our industry can now offer deeply immersive experiences and spaces – unique, out-of-home shared adventures. Most promising (and creatively challenging) are experiences wherein the guest has agency – the power to make choices and take actions that affect what happens next.

The non-linear, connected immersion experience is not just playing the game. It's passing through a physical portal and playing inside the game, with real-time results and variable outcomes. It's living a different story each time, because what happens depends on your decisions and actions as well as the decisions and actions of other guests. It's the unique, competitive offering that will bring attendance and repeat attendance to out-of-home leisure destinations.

The immersive, interactive, real-time, responsive space can provide a unique platform for bringing a blockbuster IP to life. Or it may be the vehicle of original artistic expression, or convey a moment in history, or share a folk tale, or scientific exploration... or many other adventures. What matters is that this fluid form of storytelling and guest experience has emerged as the leading edge of our industry. How will you harness it to make your next project compelling and irresistible?

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INTERNATIONAL THEME PARK PRODUCTION EXPERTS

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All the park's a stage

Ten AV technologies transforming the attractions industry

by Freddy Martin

The job of theme park designers and operators is to offer audiences innovative experiences that they cannot have outside the berm. Innovation requires technology breakthroughs and availability to expand artistic and technical capabilities.

When visitors first walked through early amusement parks like Vauxhall or Tivoli Gardens they were awed by the sight of hundreds of gas lamps flickering to life at dusk. Later, when Luna Park filled the air with thousands of twinkling electrical lights, guests could not believe their eyes.

Likewise, the steam calliope made its way from the riverboats to permanent homes in boardwalk amusements such as Coney Island where its sounds delighted guests and set the mood for fun. This gave way to recorded music which could be changed at will with the lift of a needle. With each new advancement in audio and visual technology, themed entertainment venues have sought to surprise their guests with new sights and sounds every time they visit.

Today's experts are exploring and employing multiple AV platforms to entertain, educate, and wow their guests. They are combining the art forms of stagecraft and filmmaking, with advancements in robotic lights and powerful video projection, along with new-century visualization technologies.

We spoke to numerous designers, service providers, and operators – all with substantial industry credits and international experience – to share their observations and insight and to identify 10 AV technologies that are helping to accelerate the current evolution of the themed entertainment industry.

Not surprisingly, their answers focused less on specific tools, brands, or solutions, than on how the technologies work together to offer increasing flexibility and control. Like visual artists who work in mixed media on canvas, these experts recognize that a blended use of today's available AV technologies ultimately leads to greater opportunities for creativity and effective storytelling.

"Innovation does not have to start from zero. We use what is available to mix and match, to customize and improve upon the technology," said Bingo Tso, Senior Vice President of Advanced Communication Equipment (ACE), a major AV provider based in Hong Kong, among whose credits are "Legend of Camel Bells," a theatrical spectacle recently honored with a TEA Thea Award. "All in all, the available products and technologies combined cannot replace the need to integrate with the artistic requirement."

So here, in no particular order, are the top 10 AV technologies being used to revolutionize the themed entertainment industry today.

Virtual Reality

There is no question that Virtual Reality (VR) is an exciting AV technology that the industry desires to utilize as a storytelling medium for guests. At the same time, it's unanimous that VR has its challenges. Standard themed entertainment concerns such as throughput, repeatability, and accessibility remain barriers to broad, in-park installations. Even more concerning is the fact that VR can be location-agnostic, with home applications nearly as immersive as within the berm.

Still, standalone attractions like The Void, based on popular IP, have set an example of how the medium can enhance an out-of-home destination. And museums, FECs, and escape rooms have adapted VR to enhance the sensory response to their existing attractions.

"These technologies enable a more intimate sensory experience," said Alan Anderson of Smart Monkeys, a leading show control specialist headquartered in Miami. "The story is lived in a more 'primal' way and allows a deeper emotional connection. The opportunities for creating meaningful attractions are exponential."

Augmented Reality

The continuing evolution of tablet and app technology is creating new ways for guests to interact with the exhibits and one



Virtual reality has many potential applications, but also has limitations that are still being addressed.

公园即是舞台：

十种改变游乐景点产业的音视频技术（选录）

作者：Freddy Martin

主题公园设计者和营运人员的工作，是为游客提供在别处无法获得的崭新体验。创新，需要技术的突破和适用性，以扩展艺术和技术的表现力。

当今的专家们通过对多个音视频平台的探索和运用，在使游客叹为观止的同时也获得了乐趣和知识。专家们将舞台艺术与电影制作的艺术形式相结合，并融入了先进的智能灯光和强大的视频投影，还有VR（虚拟现实技术）或者AR（增强现实技术）这类新世纪的科技。

通过与多个拥有丰富的国际项目经验，蜚声业内的设计师、服务供应商和营运人员的交流，和他们对各自观察见解的分享，我们总结了十种有益于加速主题娱乐行业发展的音视频技术。

毫无疑问，他们的回答对特定工具、品牌或者解决方案的关注度，远不及不同技术之间的协作。这种协作可以提高灵活性和控制能力。正如在画布上进行混合绘画的视觉艺术家，这些专家认识到现今可用的音视频技术的融合汇通，会给创作和有效叙事提供更多的表现机会。

“创新不必从零开始。我们用可混合匹配的资源，对技术进行定制和改进。”安恒利(国际)有限公司高级副总裁曹荣臻表示。该公司总部位于香港，是主要的音视频供应商，其项目业绩之一实景演艺“骆驼铃声”秀最近荣获了TEA THEA颁发的奖项。“总而言之，现有产品和技术的结合不能替代与艺术要求相结合的需要。”

故在此列出十种用于改变当今主题娱乐行业的音视频技术，排序不分先后。

虚拟现实技术

毋庸置疑，虚拟现实（VR）是一种令人兴奋的音视频技术，业界普遍希望将其作为对游客讲述故事的方法之一。与此同时，大家也都认同VR存在一定的挑战。主题娱乐行业的普遍担忧，如流量、重复性和可及性，仍是进行大范围园区安装的阻碍。而且更多的担忧，其实是源于VR的家庭应用几乎跟专业应用一样好的事实。

“这些技术可以带来更为亲密的感官体验，”工作于Smart Monkey的Alan Anderson说。Smart Monkey总部位于迈阿密，是表演控制方面的引领专家。“故事选用更‘原始’的方式，可以带来

更深的情感连接。创造有意义景点的机会也越来越多。”

增强现实技术

平板电脑和应用技术的不断发展为游客创造了与不同展项互动的新方式。增强现实技术（AR）的应用可以说是把影响体验结果的权力交到了游客手中。

“智能手机、平板电脑和应用程序的使用，给所有人提供了一种可用于游乐景点的新工具，尤其是在博物馆和家庭娱乐中心。”月桂树咨询公司(Bay Laurel Advisors)总裁George Wade说。他亦是场地型娱乐空间知识产权持有者的顾问。“技术的关键在于我们不能为了技术而专注于技术。我们要谨记，我们正在为游客提供的是全面且可重复的体验，这样对营运方才更有利。”

增强现实技术使营运方可以将各种元素更好的融入景点或者区域发展的体验中去，将大大超出了游客的期望。

“我相信在接下来的一年中，我们会看到主要的主题公园所呈现的巧妙运用增强现实技术的作品。”Mycotoo（洛杉矶）公司董事长Cliff Warner说。“想象一下，戴上清晰的护目镜，你将看到区域发展中交错的角色和效果，而游乐设施中的场景体验亦将达到一个全新的水平。”

大规模无人机

2018年冬季奥运会让全世界看到了大规模无人机表演广阔的娱乐潜能。在开幕式上，共有1218架无人机出现在平昌的上空，多次组成了五彩缤纷的动画形状和角色。尽管该项技术之前已被应用到其他活动中，但这次精彩的展示向世人呈现了前所未有的新规模和应用范围。该技术获得了2019年TEA Thea的奖项。

英特尔无人机集团总经理Anil V. Nanduri表示：“我们对英特尔无人机灯光表演的可能性感到异常兴奋，不仅是因为这项技术可以为观众带来令人惊叹和激动的体验，更因为它是无烟、无污染、无噪音、可重复使用的烟花替代品——或者，在某些方面，甚至更胜于烟花。”

投影映射



Intel drones provide a showstopping moment during the 2018 Winter Olympics in PyeongChang, South Korea. Photo courtesy of Intel.

another. Augmented Reality (AR) applications put the power to influence the outcomes of the experience literally into the hands of the guests.

The Crayola Experience, a multi-location brand museum and activity center, uses AR technology in an attraction called Color Magic that allows guests to interact with the company's core product in a unique way. Visitors color the image of a character on paper, scan it into a console, and, in seconds, their artwork comes to life on screen as an animated character they can play with.

"The use of smartphones, tablets, and apps has given all of us a new toolset that can be utilized in attractions, especially in museums and FECs," says George Wade, President of Bay Laurel Advisors, a consultant to IP holders in the LBE (location based entertainment) space. "The key to technology is we can't focus on technology for the sake of technology. We have to remember that we're providing a guest experience that should be well-rounded and repeatable for the guests, and therefore more beneficial to the operator."

Augmented reality promises to enable operators to integrate elements into the experience of the attraction or property that will far exceed guest expectations.

"I believe in the next year we're going to see the major theme parks reveal augmented reality components being utilized in fascinating ways," said Cliff Warner, Chairman of Mycotoo (Los Angeles). "Imagine wearing clear goggles that enable you to see characters and effects intertwined within the area development or the scenery of the ride which will take the experience to a whole new level."

Mass Drone Flight

The 2018 Winter Olympics gave the world a chance to see the broad entertainment potential of a mass, aerial lit drone show. During the opening ceremonies, 1,218 drones filled the sky above PyeongChang, forming and re-forming into colorful, animated shapes and characters. Although the technology had

been seen before in other events, this brilliant display revealed a new breadth of scale and scope not previously achieved. The technology was recognized in 2019 with a TEA Thea Award.

"We are excited for the possibilities of Intel drone light shows," said Anil V. Nanduri, General Manager of Intel's Drone Group, "not only for the awe inspiring experiences that the technology can evoke for audiences, but for the fact that it is a smoke free, pollutant free, noise free, reusable alternative to fireworks - or, in some ways, to even augment fireworks."

The combination of technologies including light-weight, LED lit drones, along with automated control software, allows show directors to create increasingly complex and precise animations in the sky. This will offer operators even greater opportunity to create unique experiences for their guests.

Credited as the inventor of the Shooting Star drone system that powered the Olympics show, Intel Senior Principal Engineer Daniel Gurdan was quick to recognize the role of the technology in the creative process. "It's only a tool," he said in a presentation at the 2019 TEA Summit, "so we need creative people to create something that people want to come and see."

Projection Mapping

Few recent visual effects advancements have triggered the excitement and broad adoption for location-based entertainment attractions and venues as projection mapping. Although the technology has matured to some degree, it is still advancing (see Laser Projection below). Today, the industry enthusiasm for projection mapping comes because of its flexibility to be blended with other technologies for greater effect.

"I think there's convergence like never before between projection and show lighting. I think that we're on the cusp of blending the two together to create some amazing illusions," said Mark Andrew of Los Angeles-based Remarkable Light, a top attractions lighting designer. "By combining different lighting technologies—traditional show lighting, projection, fiber optics, lasers—you can create some really beautiful effects."



The Universal Spectacle Night Parade utilized projection mapping on buildings and floats. Photo courtesy Universal Studios Japan.

最近几个视觉效果进步触发了场地型娱乐景点和场馆的兴奋，投影映射被广泛应用。尽管该技术已经成熟到一定程度，但还是相对超前的（请看下面的激光投影）。当前业界对投影映射的热情源于其可以灵活地与其他技术融合，获得更好的效果。

“我认为投影和表演灯光的结合前所未有。我觉得我们处于把两者融合在一起并营造出美妙幻象的临界点。” Mark Andrew，来自洛杉矶 Remarkable Light的顶级景点灯光设计师说，“通过不同灯光技术的结合，传统表演灯光、投影、光纤、激光——你可以创造出一些非常出色的效果。”

激光投影

相较于传统的灯泡投影机，激光投影机提供了更高的亮度和色彩饱和度。尽管激光投影机还是比灯泡投影机昂贵，但他们不会快速降级或老化，并且随着时间的推移，维护成本也会降低。随着技术的进步和研究的不断深入，激光投影机的价格会逐步降低，选择也会更多，会更适用于各种规模的营运商。

“激光投影技术的发展将持续提升在公园里使用投影的能力，” TechFulcrum创始人思诺德说道。TechFulcrum总部毗邻迈阿密，是一家拥有众多业内项目业绩的技术设计公司。“我们现在进行中的一个项目，可能会使用大量的激光投影机，但如果只能使用灯泡投影机，这根本就不会被考虑，光是因为数量众多而产生的运行维护成本。”

LED视频墙

新兴LED技术不断地打破大面积视频显示的界限。通过多种激动人心的方式，业内发现替代图像投影的新机遇。

业内创意先锋且在媒体型景点有开创性成果的FAR Out! Creative Direction首席创意总监Rick Rothschild说：“尤其是球型和非常规几何面显示屏的选择，开创了故事讲述和创作体验的新方式，使其越来越身临其境，并融入了其他的3D故事讲述形式。”

Mark Andrew说：“像素间距越来越小，分辨率越来越好，亮度控制也到了一定的程度，现在的很多案例更多的是倾向选用视频墙，而不是投影。”

全息视频

全息视频技术的创新，为以CGI效果为特色的卓越现场表演的提升做了铺垫。这些CGI效果将与动态舞台无缝连接。

2019年，孩之宝将举办变形金刚电子音乐节，他们机器人角色的巨型全息图像将会在现场舞台上表演（和变形），包括与演员和观众的实时互动，使得每个表演都是独一无二且令人难忘的。

“通过使用最先进的全息技术和AI（人工智能）最新的创作，我们可以将我们的变形金刚角色带到现实生活中，目前为止他们只能生活在2D电影或者电视世界里。” Matt Proulx，场地型娱乐公司孩之宝副总裁表示。

低成本RGB LED

一个多世纪前，煤气灯退出历史舞台，电灯取而代之；今天，RGB LED正在彻底改变业内为主题环境、花车巡游和现场表演等的打光方式。尽管这项技术已经存在了一段时间，但是其成本的降低和可用性的提升，使RGB LED的更多使用方式成为了可能。

长隆海洋王国使用了上百万个变色LED灯打造了一场夜间视觉盛宴，其多变的颜色和灯光是之前任何花车巡游都无法企及的。海洋夜光巡游远不止是一系列五彩斑斓的花车和戏服，其制作人创作了一场由始至终风格统一且可以瞬间变化的表演。

Miziker Entertainment高级项目总监Sean Chung说：

“过去，当我们在巡游花车或者演出布景上装灯时，我们受限于一灯一色。但LED的价格越来越能被接受，我们可以把每盏灯都做成RGB的。一旦我们把所有东西都做成了RGB，我们就可以在巡游中控制每盏灯的颜色和亮度。这使我们得以创作出世界上第一个将其广泛应用的巡游活动。” 海洋夜光巡游获得了2019 TEA Thea奖项。

沉浸环绕声

音景和主题公园环境内的视觉景观一样重要。设想一下，倘若失去了虫声、猿啼和鸟鸣，迪士尼森林河流之旅将是怎样的体验？如今，环绕声成为了设计师的通用工具，用来创造更多身临其境的声音环境，加强区域的真实性和氛围。

Miziker Entertainment总裁Charlotte Huggins谈到：“相较于5年前，现今游客对音景的期望远超之前。今天，我们正在获得针对特定位置的受控音景，这有助于我们营造一个比以往更能精确控制的整体声音环境。”

Laser Projection

Laser projectors provide a brightness and wider color gamuts than previously achievable with traditional lamp projectors. While still more expensive than bulb projectors, they do not degrade as quickly and have lower maintenance costs over time. As the technology improves and research continues, the price point and selection of laser projectors have improved making their use much more available for operators of all sizes.

“The advancement of laser projection technology is continuing to further the ability to use projection in parks,” said Scott Arnold, Founder of TechFulcrum, a technical design company with many industry credits, headquartered in Miami. “We’re working on a project now that would potentially utilize many laser projectors, but if we had to use lamp projectors this wouldn’t even be considered, just because of the sheer number of them and the amount of maintenance needed to keep them running.”

LED Video Walls

Emerging LED technology continues to push boundaries for large surface video displays. The industry sees new opportunities to replace image projection in a variety of exciting ways.

“In particular,” said Rick Rothschild, Chief Creative Director at FAR Out! Creative Direction, a creative pioneer of the industry with groundbreaking work in media-based attractions, “dome and irregular surface geometry display options are opening up new ways to tell stories and create experiences, allowing them to become more and more immersive and integrated into other forms of 3D storytelling.”

Attractions and shows like Guardians of the Galaxy - Mission: BREAKOUT! or King Kong on Broadway are utilizing the technology to a near perfect effect where projection would have fallen short of the desired effect.

Mark Andrew said, “The pixel pitch is getting tight enough, the resolution is getting better, and the intensity control is to the point where, in many cases, it is now preferable to use video walls over projections.”

Holographic Video

Innovations in holographic video technology have paved the way for remarkable live show enhancements featuring CGI effects that seamlessly integrate with the action stage.

In 2019, Hasbro will launch a TRANSFORMERS electronic music festival that will include gigantic holograms of their robot characters performing (and transforming) live on stage, including real-time interactions with cast and audience members to make each performance unique and unforgettable.

“By utilizing state-of-the-art holographic technology and the latest innovations in AI [artificial intelligence], we can bring our TRANSFORMERS characters to life in the real world,” said Matt Proulx, VP of Location Based Entertainment for Hasbro.

“This real-world connection helps to enhance the affinity for our beloved TRANSFORMERS characters and brand by creating a truly unique, one of a kind, visually impactful and emotionally compelling experience that establishes a new dimension of entertainment for our TRANSFORMERS fans.”

Low-Cost RGB LEDs

The gas lamp gave way to the electric light more than a century ago, and today, RGB LEDs are revolutionizing the way our industry lights themed environments, parades, and live shows. Although the technology has been around for some time, decreasing costs and increased availability are making it possible to utilize RGB LEDs in more ways than ever.

Chimelong Ocean Kingdom utilized one million color-changing LEDs to create a nighttime spectacular that did more with color and light than any parade had done before. Journey of Lights went far beyond a series of colorful floats and costumes – producers created a unified show from start to finish with the ability to be changed all at once.

“It used to be that when we put lights on a parade float or show set, we were limited to one color per light,” said Sean Chung, Senior Project Director for Miziker Entertainment. “But LEDs became so affordable that we could make every single one of our lights RGB. Once we made everything RGB, we had control over the color and brightness of every single light in our parade.” This allowed the team to create moments during the parade when sweeping color and lighting changes happen simultaneously along the entire parade route. Journey of Light was honored in 2019 with a TEA Thea Award.

Immersive Surround Sound

The soundscape is every bit as important as the visual landscape in theme park environments. Imagine Disney’s Jungle Cruise without the sounds of bugs, monkeys, and wild birds. Today, surround sound gives designers versatile tools to create even more immersive audio environments that add to the realism and mood of an area.

“Soundscaping is something guests expect much more than they did five years ago,” said Charlotte Huggins, President of Miziker Entertainment. “Today, we’re getting location-specific, controlled soundscaping that helps us create a holistic sound environment with more precise control than ever before.”

This kind of control is also essential in live shows, especially in large or motion-base theaters where movement and interactivity have the potential to shift the direction of sound.

“With these kind of new venues, traditional sound systems no longer fulfilled our needs,” said Bingo Tso. “Thus we had to develop our own processor that can up-mix stereo music into a multi-channel system.” Referring to “Legend of Camel Bells,” he said, “We successfully applied this technology in a large-scale, live spectacular that immersed the 3,000 person audience in a massive surround audio environment.”

现场表演中，这类型的控制也是必须的，特别是大型或者动态型剧院，其移动和互动都有可能改变声音的方向。

“随着这类新型剧院的诞生，传统的声音系统再也无法满足我们的需要。”曹荣臻表示，“因此，我们必须研发自己的处理器，可以将立体声音乐混合到多通道系统中去。以骆驼铃声为例，”他说：“我们成功地将该技术运用到大型实景演出，使我们的3000名观众沉浸在大型环绕声音环境中。”

表演控制平台

虽然到目前为止，我们已经列出了九种创新和革命性的音视频技术，但是很显然，没有任何一种技术可以独立完成工作。表演控制系统的进步为这些技术中的两种，三种，或者是全部在同一景点或者演出中协作，创造了机会。

“我们必须创建灵活和开放的平台，”来自AV Stumpf GmbH（总部位于澳大利亚）的Helmut Protte说到，“这样营运人员和表演经理可以将所有这些新技术整合到一个易操作的界面上，同时为他们的创造力减少技术限制。”

对于某些应用来说，这相当于对表演元素的控制，比如多屏视频或者投影映射。“视频服务也在发展，”思诺德说，“我们从一个只能简单播放视频的盒子发展到回放平台，实现现在服务器级别可以完成的网格校正、遮蔽、分层、融合、动态追踪等多种炫酷的操作。”

表演控制系统现在也被用于实现灯光和声音矩阵的交互，实现园区和特定位置的控制。

音视频将大放异彩

我们对主题娱乐行业领导者的调查体现了一个事实，音视频技术经常被视为一种实现方式，一种更会讲述故事的工具。同时，设计师、工程师和营运商的想法也所见略同，希望通过发展视觉和声音技术，为游客提供更多身临其境的体验，让他们可以短暂逃离现实。

“音视频技术的目标之一是打破限制，”Sean Chung说，“不是受限於剧场或者景点，而是整个公园都成为一个大型可控的剧院环境，可以在全新规模下创造更多激动人心的游客新体验。我想说，整个公园，就是我们的舞台。”……

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Our panel of experts



ALAN ANDERSON - Managing Partner/ Co-Founder, Smart Monkeys Inc. - Known for creating solutions that focus on maximizing guest experience through innovative technology and reliable infrastructure, Alan has directed the design of many show control installations that have received numerous awards worldwide. Smart Monkeys, Inc. is a technical consulting firm specialized in feature-centric design and show control implementation.



MARK ANDREW - Principal Designer, Remarkable Light - Mark is a sought-after lighting designer whose work focuses on rides, attractions, themed restaurant and retail spaces, corporate visitors centers, and museum exhibits. His work includes Test Track at Epcot, The Shuttle Launch Experience at Kennedy Space Center, Skydeck at the Sears Tower, and BattleStations 21, a state of the art disaster training facility for the US Navy.



SCOTT ARNOLD - Founder, TechFulcrum - An experienced technical director and business executive, Scott has a diversified background with the consultation, design, and management of themed entertainment projects around the world. He has led various technology discipline design and installation teams for SeaWorld Parks & Entertainment, Busch Gardens, Universal, Chimelong, and Disney.



SEAN CHUNG - Senior Project Director, Miziker Entertainment - Sean's work in themed entertainment began with production on Power of Nature, a 3D giant screen attraction film for the Wanda Group. He has since led special venue and parade spectacular projects for clients such as Chimelong, Genting Malaysia and Warner Bros., including the technically and creatively complex Journey of Lights Parade at Chimelong Ocean Kingdom.



CHARLOTTE HUGGINS - President, Miziker Entertainment - Charlotte is a multi-format media and movie producer of dozens of IMAX, special venue and feature films as well as ride and attraction films for theme parks clients including Disney, Futuroscope, and de Efteling. Recent achievements include the celebrated Journey of Lights Parade at Chimelong Ocean Kingdom and Chimelong Scareadise at Chimelong Paradise.



ANIL V. NANDURI - Vice President, Intel, General Manager, Drone Group - Under Anil's leadership, the Intel Drone Group provides solutions for drone light shows which have entertained audiences worldwide including the PyeongChang Winter Olympics Opening Ceremonies and the new Dark Arts at Hogwarts Castle show at Universal Studios Hollywood. In 2019, Intel's Shooting Star Drone System received a TEA Thea Award for Outstanding Technical Innovation.



HELMUT PROTTE - Global Business Development Manager, AV Stumpf - Helmut is an expert in real-time video media server and show control for AV Stumpf, an award-winning Austrian company that designs and manufactures high-performance projection hardware and show control systems. Their media servers were used for the production of the acclaimed Pigments de Lumière, a projection show at Fête des Lumières in Lyon, France.



MATT PROULX - Sr. Director, Global Branded Experiences, Hasbro - Matt is charged with enhancing Hasbro's global presence in themed entertainment attractions, around the world. He has built long-term relationships with a variety of entertainment partners, including Universal, (TRANSFORMERS The Ride), Carnival Cruise Lines (Family Game Night), and innovative experiences such as Monopoly Mansion, the first ever MONOPOLY-themed hotel.



RICK ROTHSCCHILD - Chief Creative, FAR Out! Creative Direction - Blending a unique set of entertainment skills developed over 40 years of experience as a filmmaker and director, Rick brings together a strong creative perspective with deep technical knowledge to provide both vision and direction to themed entertainment projects worldwide. He is currently providing creative direction for the Chimelong Group and the FlyOver attractions by Pursuit.



BINGO TSO - Senior Vice President/CTO of ACE International - A 40-year veteran in the pro-audio industry, Bingo has introduced many new technologies to the market and trained hundreds of engineers. He has been involved in the production of many significant events in China, including the Beijing Olympics and the Shanghai World Expo. The live, multimedia stage spectacular Legend of Camel Bells received a TEA Thea Award in 2019.



GEORGE WADE - President & Chief Advisor, Bay Laurel Advisors - A recognized leader in the development of high-end, mixed-use entertainment projects, George is an expert in brand development within the location-based entertainment industry. His company helps clients bring unique experiences to consumers in out-of-home real estate environments. His clients include Crayola, Halo/X-Box, Peanuts Worldwide, and Hasbro Toys.



CLIFFORD WARNER - Chairman, Mycotoo - Cliff is known for being one of the top producers of award-winning experiences including Universal Studios' WaterWorld Stunt Show, FiestaAventura's Templo Del Fuego, Bollywood Park and Motiongate - including TEA Thea Award recipient DreamWorks Animation Zone. He co-founded Thinkwell Group and Mycotoo, a leading entertainment design and development company.

Show Control Platforms

Although we've listed nine innovative and revolutionary AV technologies so far, it is clear that no single technology does the work on its own. Advances in show control systems create opportunities for two, three, or all of these technologies to work together within one attraction or show.

"We have to create flexible and open platforms," said Helmut Protte of AV Stumpfl GmbH (headquartered in Austria) "which allow operators and show managers to combine all that new technology under an easy-to-use interface, while reducing the technical limitations for their creativity."

For some applications this amounts to control over elements within a show, such as multi-screen video or projection mapping. "What is serving up the video is improving as well," said Scott Arnold. "We went from having a box that simply spit out video to playback platforms that can do mesh correction, masking, layering, blending, motion tracking, and all kinds of cool things that can now be done at the server level."

Show control systems are also now being used to create interconnectivity across the lighting and sound matrix allowing for park-wide, location-specific control.

"When we create a parade or parkwide event, we include lighting and audio," said Charlotte Huggins. "But now, with today's new

technologies, the park or zone is designed with discreet and specific control over every speaker and every light, then we can do immersive and theatrical park-wide events."

AV Unleashed

Our survey of leaders in the themed entertainment industry paints a clear picture that AV technology is often treated as a means to an end, a tool toward better storytelling. At the same time, designers, engineers, and operators appear to be united in their desire to develop the technology of sight and sound to create ever more immersive environments for guests that help them escape reality for a brief moment in time.

"One of the goals of AV technology is to take away the limits," said Sean Chung. "Instead of being confined to a theater or attraction, now the entire park has become a large-scale controllable theatrical environment capable of creating breathtaking new guest experiences on a completely new scale. I like to say that the whole park is our stage." • • •



Freddy Martin (freddy@themedattraction.com) is a writer, storyteller, and independent consultant. He began his theme park voyage as a skipper on Disneyland's Jungle Cruise. Freddy co-hosts the Themed Attraction Podcast with Mel McGowan of Storyland Studios, and is a regular contributor to InPark as well as ThemedAttraction.com. He blogs at FreddyMartin.net.


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What's the DEAL?

Industry professionals from around the world gathered in Dubai for the annual exposition organized by International Expo-Consults LLC

by Martin Palicki

Celebrating its 25th anniversary, DEAL convened over 300 exhibitors and thousands of attendees in Dubai last March for the three-day trade show. On the expo floor everyone remained upbeat about prospects for growth in the region, though Dubai remains a city full of questions.

With work well underway for Dubai Expo 2020, and ancillary projects supporting it increasing in number, it's clear many hopes have been pinned to the six-month-long world's fair. For post-Expo, a robust legacy plan has been created for the site, which will essentially transform it into an independent community.

Dubai has shown success in being able to transform and reinvent itself throughout its short modern history, and local optimism runs high, even as socio-cultural, political, and market changes are inevitable. Jose Silva, CEO of The Jumeirah Group, said in a recent interview for Arab News (<http://www.arabnews.com/node/1475171/business-economy>) he doesn't think the "Dubai Dream" has faded.

"Has it reached a certain maturity? Probably. Is it going to be double-digit growth forever? Of course not. But tourism growth is ... at just under 4 percent per year, and supply (of new hotel rooms and facilities) is about 5 percent," Silva said. "Dubai is the fourth most visited city in the world, just after Paris. When a city has reached that critical mass, there's no going back. You don't become the fourth most visited city in the world just by being a dream. And if the fourth most visited city in the world is growing at 4 percent, I don't think we've got a problem."

Silva goes on to acknowledge that the leisure industry will have to adapt to the softening economic outlook, even while his own company continues work on a major new development. Marsa Al Arab, located near the iconic Burj Al Arab, will relocate and expand the existing Wild Wadi Waterpark while creating a host of new entertainment and retail venues on existing and reclaimed land along the coast.

While it is still unclear exactly what Dubai will look like 5-10 years from now, the attractions industry is still betting on a future for the Emirate, and the MENA market, that remains decidedly bright. Attendance at DEAL is only one indicator that the industry is still invested in the UAE's success.

"We have a lot of business in this region, so it's important for us to be here at DEAL," said Markus Beyr, managing director at Attraktion!, a creative and project development firm with products and installations scattered around the world. [See "The Pearls and Pixels of Attraktion!", InPark Magazine issue #75]

Where are you from?

Vendor attendance at DEAL remains stable, but where those vendors are coming from is changing. Of the roughly 300 exhibitors at the 2019 conference, a solid 40% came from China. Europe accounted for 30%, while MENA companies were 13%. The USA came in at 8% and the remaining areas (Asia, North America, South America, Australia and Russia) all accounted for less than 3% each. It is likely that proximity to the Middle East impacts which regions are most readily represented, but access

Many attendees at DEAL come from the MENA region to visit over 300 vendors on the expo floor.





Video games, simulators and VR converge in progressively smaller packages.



40% of the exhibitors at DEAL 2019 originated from China; 30% came from Europe.

to markets is also driven by where buyers wish to source from, as well as what products they are looking for.

The strong Chinese presence is indicative of the expanding offerings from their vendors. While most Chinese products still seem to target the FEC market, more theme park and waterpark products are steadily emerging from the Chinese marketplace. Technology-heavy VR experiences are already readily available. While issues of IP infringement and lower prices are sometimes mentioned, it's ultimately the developer's prerogative in determining how important any one issue is. Based on the Chinese presence at the show alone, at least in this region, it seems the developers have spoken.

It's all fun and games...

Again, looking at the vendors in attendance, it's clear that FECs remain the primary type of LBE facility in this region. The majority of vendor space was devoted to video games, VR experiences, small rides and inflatables – all products primarily (though not exclusively) targeted for FECs. In addition, Saudi-based Al Hokair group was actively seeking new franchisees at the show from around the MENA region.

Interestingly, there appears to be a further merging of simulator-style attractions with video game systems. What was once almost exclusively a theme park experience (and before that, a military and aerospace development) is becoming more accessible, available for individual experiences and gaming.

Companies such as Triotech have been bringing small simulators to FECs for over a decade, so this isn't revolutionary. But it is evolutionary, as VR, motion simulators and gaming all move closer to one another in the entertainment playpen.

Dubai nights

While DEAL doesn't plan much in the way of after-expo activities, other businesses and groups offered networking mixers. One popular event featured a consortium of sponsors: ProSlide, Thinkwell, Concept 1900, Uno Parks, Mint Creative Production and Herborner Pumpentechnik, in association with the Themed Entertainment Association. Attendees gathered for food and drink at the Seafood Kitchen, with direct views across the water to Atlantis The Palm.

Thinkwell's Amin Rashmani (managing director, EMEA) served as primary host for the event, which graciously welcomed over 120 guests. As the evening progressed, shisha pipes emerged and guests continued to network and share opportunities available around the MENA region.

The World Waterpark Association held a two-day symposium in the UAE alongside DEAL, and also offered a member evening meet-up. Symposium attendees, including a large contingent from Atlantis' Aquaventure waterpark, enjoyed refreshments while mixing with waterpark industry suppliers.

WhiteWater's Paul Chutter (chief business development officer) attended the mixer, held at Stars N Bars La Mer, which is located across from the recently opened Laguna Waterpark. WhiteWater supplied slides, play equipment and a 180-degree WaveOz surfing experience for Laguna.

"We have many long-term partners in this region and continue to be a major supplier here in the UAE," said Chutter. "We are thrilled to be here in Dubai again for both the WWA Symposium as well as the DEAL Exhibition." • • •

DEAL returns to the Dubai World Trade Centre March 23-25, 2020.

Beyond AV control

Show control empowers storytelling in state-of-the-art attractions

by Eric Cantrell, Barco

Show control systems, simply defined, automate and coordinate disparate technologies for the purpose of telling stories. In the past, these technology functions were managed by hand, following careful scripts and cues. Depending on an operator to get every cue and signal correct, and simultaneously manage multiple technologies, gets very challenging as the complexity of the stories increases.

Simple stories might include synchronizing lighting and special effects with audio and video, as in a 4D theater. More complex applications such as theme park attractions, live concerts or parades use show control to automate audio, video, lighting, animatronics, special effects, fountains, and lasers, all coordinated with GPS or RFID triggers. From simple to complex, show control technology is based around some relatively straightforward ingredients that, when combined in the right mix, are a recipe for storytelling magic.

AV control compared to show control

AV control systems typically include the basic functions of the devices they control, simplifying a half dozen control devices down to a few pages on a touch screen. Beyond that, they can use macros or presets to simplify multi-step functions. Show control, however, takes the notions of device control, macros, and presets, and takes them to the next level, adding in synchronization and interactivity. The result allows the lighting looks and special effects to execute at exactly the right time, in the proper sequence with audio or video media every time, without a dedicated operator pressing the “go” button.

This consistent experience is absolutely essential when the same show has to execute dozens or hundreds of times a day as, for example, scenes in theme park attractions. Today, shows of large scope, having a great many cues within them and rapidly unfolding action, will be challenging for a single operator, or even a team of operators to run with consistency.

There is still a place for human operators within the show control landscape, especially for live shows where human or animal performers can affect timing. Show control simplifies these complex operational systems by making it possible to manage a large amount of equipment from a single interface.

Show control enables effects and sequences – and accompanying safeguards and contingencies - that wouldn’t otherwise be possible, such as the action of a show happening ultra fast, beyond what a human operator could react to. For example, if a character is highlighted by a flash of light when a high-speed stage lift reaches the top, but a safety fault on the lift causes it to

stop, the flash of light would highlight the hole in the stage. The show control system notices the fault and reacts by triggering a different lighting cue in time with the music, directing the audience’s attention elsewhere on stage. Show control allows contingencies to be scripted so even if the show isn’t going as planned, the audience would never notice.

Integration and interface

Knowing the status of the devices in your system is important, especially for unattended operation. Show control systems periodically poll connected devices for status information and update an internal list of the current state of everything they are managing. This information can be used to trigger actions such as sending an e-mail, updating a graphical object on an operator interface, or switching to a backup video source. Automation is made possible by the bi-directional and real-time nature of the device drivers.

Technologies from different disciplines sometimes affect one another and must be closely coordinated, and that can be challenging when the tools for managing each type of system are in the hands of many operators. Show control systems are often used to “translate” from one type of control to another to make cross-departmental cooperation easier. When live events are captured by camera operators, the lighting must be consistent, and LED video elements have a tendency of being too bright for the cameras. The video director works with the lighting team to balance the lighting for the cameras. A show control system can listen to the data transmitted by the lighting console and translate that information into brightness control commands for the LED processors. This enables the technician at the lighting console to balance the brightness of the LED wall for the cameras, just as she does with the lights.

Application: Storytelling

A wide variety of applications benefit from show control, such as:

- Live shows, concerts, and events
- Trade show exhibits, museums, world’s fair pavilions
- Corporate experience centers, visitors centers
- Theme parks (attractions, parkwide AV and lighting control, parades, nighttime spectacles)
- Cruise ships (shows, venue lighting and AV automation)

The common denominator is storytelling with technology. Wherever there is a story that technology is helping to tell, you’ll typically find some form of show control technology coordinating it behind the scenes.



Show control helps keep complex shows like Wings of Time on Sentosa Island in Singapore running smoothly.
Photo courtesy of David Birchall, db Show Control & Automation.

Show control systems are also used for basic tasks, such as turning on and off interactive kiosk PCs, resetting Power Over Ethernet switch ports to reboot network cameras, automatically transferring media to a backup players from network attached storage devices, or generating log files. Most systems are programmed to automate the daily startup or shutdown sequence for the equipment.

Evaluation and best practices

In evaluating show control options for your project, here are some important considerations:

- What are the main functions required by the system? This goes beyond simple device control. Will protocol translation be used? Is there a requirement of synchronization or automated show branching?
- Who will be operating the system? Are they trained technicians or untrained docents? Decisions about how to create user interfaces depend on the type of users the system will have.
- What kind of tasks will users need to use the system to perform? Are these tasks outcome driven or simple device commands?

There are no trade organizations dedicated to show control, though show control professionals can be found within the ranks of the Themed Entertainment Association, IATSE, IAAPA, and InfoComm.

Those passionate about show control best practices are in good company. Each year during the InfoComm trade show

in June, a show control “Geek Out” event featuring show control case studies is organized by John Huntington, professor of Entertainment Technology at New York City College of Technology and Jim Janninck, owner of Timberspring, Inc., a control systems design and engineering firm based in Orlando. At the Geek Out, presenters show their industry peers the interesting show control applications they have worked on and discuss the challenges they faced and how they used show control technology to solve them. The event is enthusiastically well-attended so that members of the show control community can learn from one another.

The pro AV industry continues to push the boundaries of show control as the emphasis on end user experience becomes more and more important. Nowadays, show control systems are highly robust and are the brains behind nearly all consumer-centric experiences that involve lighting, sound, movement and storytelling. This is certain to continue as technology evolves and adapts to the demands of an experience-centric culture. •••



Eric Cantrell has been telling stories with AV technology his entire career. Starting off in stage management and lighting for live theatre, Eric discovered show control technology working on cruise ships. Bringing together audio, video, lighting, and special effects with the secret sauce – timing – is what attracted him to show control, ultimately landing him his current position as

Product Manager for the Medialon show control product line at Barco. He is an active participant in #AVinTheAM industry discussions Sunday mornings on Twitter.

“Wherever it takes us”



Cobra's Curse at Busch Gardens Tampa

The Producers Group embraces the future and builds on the past

By Mark Eades and Judith Rubin

The creators of great guest experiences in themed entertainment can never stand still - because client expectations, guest expectations and the tools of the trade are always evolving.

Since 2011, the international attraction production specialists at The Producers Group (TPG) have taken the company forward into new ventures, regions and markets. But while moving forward, they never lose sight of the industry's past, and what it has to teach.

With several decades of combined experience in the attractions industry between them, TPG founders and co-CEOs Bob Chambers and Edward Marks sought to create a versatile firm able to work and collaborate with a wide range of companies and cultures around the world. Today, TPG maintains offices in Shanghai, Orlando, Dubai and Los Angeles, with a staff of nearly 50 professionals spanning a variety of disciplines. This enables the company to serve mature and developing markets, with the flexibility to work on any size project in lead or supporting roles.

An additional resource that helps TPG to stay ahead of the curve – to focus on the future while learning from the past – is their distinguished brain trust – a group of executive advisors with sterling industry credentials.

Future focus and brain trust

“I like to remind our designers and clients that there is the right approach and mix of technology for their attraction, and our job is to discover it, without any bias to the new or the old. If it's right, then do it,” said Marks.

“The brain trust is one of the ways TPG stays on track to pinpoint and deliver what our clients and their audiences need from a project, and to maintain best practices,” said Chambers. “As advisors to TPG, these gifted and valuable colleagues help us focus on the future while learning from the past.”

The TPG advisors include 2013 Buzz Price Thea Award honoree and former Disney executive Frank Stanek, 2008-09 IAAPA chair Darrell Metzger (also a former Disney executive), and operations/feasibility/master planning maestro Nick Winslow,

“无论我们走到哪里”

The Producers Group 拥抱未来，不忘过去

作者：Mark Eades和Judith Rubin

以主题娱乐为主的游客体验的创造者不可能停滞不前，因为客户的期望、游客的期望以及贸易的工具总是在不断变化发展中。

自2011年以来，The Producers Group(简称TPG)精英制作人集团的国际游乐景点制作专家已将公司推向新的企业、地区及市场。但是，在向前发展的过程中，他们永远不会遗忘行业的历史，也不会忘记本行业必须教授的内容。

凭借在主题娱乐行业几十年的综合经验，TPG的创始人以及联合CEO爱德华·马克思(Edward Marks)和鲍勃·钱伯斯(Bob Chambers)旨在创建多才多艺的公司，能够与世界各地的公司和文化合作。如今，TPG在上海、奥兰多、迪拜和洛杉矶设有办事处，拥有涵盖各个领域的专业人才近50名。这使公司能够服务于成熟及发展中的市场，并能够灵活主导任何规模的项目，或为任何项目角色提供支持。

有助于TPG保持领先地位的另一个资源——专注于未来，同时也向过去学习——是他们的杰出智囊团——一群具有优秀行业资质的执行顾问。

聚焦未来及其智囊团

“我想提醒我们的设计师和客户，他们的游乐景点是有对应的正确方法和技术整合的，而我的工作就是发现这些方法和整合技术，无论对于新旧都没有任何偏见。只要是对的，那就去做吧，” Marks说道。

“智囊团是TPG保持正轨的方式之一，可以使项目精确定位，以及提供客户及其受众所需的内容，并保持最佳实践，” Chambers说道，“作为TPG的顾问，这些有天赋和有价值的同事协助我们在回顾过去的同时也专注未来。”

TPG的顾问包括有2013年Buzz西娅获奖者和迪士尼前高层Frank Stanek, 2008-09 IAAPA主席Darrell Metzger（也曾担任迪士尼高层），以及运营、可行性、总体规划大师Nick Winslow，他曾担任Harrison Price公司、华纳兄弟娱乐公司以及2010上海世博会美国馆的领导职位。

我们定期和智囊团顾问会面，探讨未来的投资以及如何让投资成功，相互尊重，将经验、观点放到桌面上讨论。“无论项目的规模和难度如何，TPG团队都非常专业、非常全面，” Nick Winslow说道。

旧的一切都是新的开始

Winslow认为，数字投影和互动游戏这类新的和不断改进的高科技爆发式出现，更加能支撑沉浸式体验环境，以及有助于游客深层次参与，这些都是良好的发展趋势。“我们将会看到更多混合的媒体内容以及互动表演秀，” 他说道，“我们会看到更多骑乘车辆，融合一些非常巧妙的技术元素，并将与骑乘和游乐景点相结合；而我们处于最佳的位置。”

随着技术的不断发展，它变得越来越容易获取。这些先进技术在预算上变得越来越可行，将这些技术应用于更多运营商和开发商的手中。反过来，这些运营商和开发商正在授权设计师使用这些新技术，以前所未有的方式让游客沉浸其中，这些新技术也是创意的源泉，促使新的旅游目的地出现。

但是某些必需品是不会改变的。Chambers指出，虽然这些新的骑乘设施可能很大程度上聚焦在新技术上，但它们是建立在长久以来的行业基础之上。“例如，在迪士尼乐园的鬼屋中有原始的讲述故事技巧和方法，我们在新项目上仍然会参考这个做法。鬼屋仍然在剧院设备应用以及使用佩

whose past professional leadership roles include Harrison Price Company, Warner Bros. Recreation Enterprises and the USA Pavilion at the 2010 Shanghai Expo.

The advisors meet regularly with TPG to talk about future ventures and how to make those ventures successful, bringing experience, perspective and mutual respect to the table. “The team at TPG is highly professional and very thorough, regardless of the size and difficulty of the project,” said Nick Winslow.

Everything old is new again

Winslow thinks the explosion of new and ever improving technologies such as digital projection and interactive gaming that support ever more immersive environments and deeper levels of guest engagement are positive signs of the future. “We’ll see more mixed media and interactive shows,” he said. “We’ll see more ride vehicles that incorporate some really neat technological elements and that will be combined with rides and attractions; we’re just at the tip of that.”

As technology continues to evolve, it is becoming more accessible. These advancements are becoming more budgetarily feasible, placing them within the reach of more operators and developers. In turn, those operators and developers are empowering designers to use that new technology to immerse visitors in ways never before imagined, fueling creativity and the emergence of new destinations.

But certain essentials don’t change. Chambers points out that while these new rides may be heavily focused on new technologies, they were built on industry foundations laid long ago. “There are original storytelling techniques and approaches from the Haunted Mansion at Disneyland, for instance, that we still reference for new attractions. Haunted Mansion remains a standard and a classic of dark rides in its application of

theatrical devices and use of technology such as Pepper’s Ghost,” said Chambers. “While borrowing from theater to create an environment, when it comes to storytelling these rides borrow from cinema, enveloping and immersing guests in the story and the world of the story, controlling what you can and can’t see. You see the special effect, but not the mechanism that makes it work.”

“People don’t care about the technology per se - they care about the experience. It has to be a fun experience,” Winslow reminds us.

IP and immersion

Nowadays, attractions are frequently based on characters and stories first seen on other media platforms. Intellectual property (IP) owners and license holders have recognized the value and embraced location based entertainment (LBE) platforms to extend story and brand. They often turn to companies such as TPG to help them understand and navigate attractions development. “The key with intellectual property is relevance to the market,” Chambers points out.

There are plenty of precedents to learn from in IP-based attractions. Michael Turner, TPG’s Vice President of Global Business Development, cites Universal Studios’ blockbuster attraction, The Adventures of Spider-Man. “It was one of the first to fully integrate multimedia, physical sets, onboard audio and dynamic ride motion,” said Turner. “It set the stage nearly 20 years ago for what we are seeing now in The Wizarding World of Harry Potter, Shanghai Disneyland’s Pirates of the Caribbean and other fully immersive ride attractions.” As Disney gears up to leverage the Star Wars IP in new lands within its Anaheim and Orlando parks this year, the world is sure to see another leap forward. Immersion in these highly themed and/or branded spaces includes making visitors more active participants, and



Top Row (L-R): Bob Chambers, Edward Marks, Frank Stanek, Darrell Metzger

Bottom Row (L-R): Jennifer Miller, Michael Turner, Nick Winslow

珀尔幻象技术上维持了黑暗骑乘的标准及经典之作，” Chambers说道，“在从剧院借来营造环境的同时，当讲故事时，这些骑乘设施借用剧院，将客人包围和沉浸在故事和故事的世界中，并控制你能看到和看不到的东西。你会看到特殊效果，但不会看到使其发挥作用的设备。”

“人们关心的不是技术本身，而是技术带来的新体验，并且必须是很有趣的体验，” Winslow提醒我们。

IP（知识产权）以及沉浸感

如今，景点通常基于其它媒体平台上首次出现的人物角色和故事。IP所有者以及许可证持有者已经意识到其价值，并采用基于场地型娱乐体验（LBE）平台来扩展故事和品牌。他们经常寻求像TPG这样的公司，来帮忙他们理解和引导游乐项目开发。“IP的关键是与市场建立连接，” Chambers指出。

在基于IP的游乐项目中，有很多先例可以学习。Michael Turner，TPG全球业务开发副总裁，引用环球的大片游乐项目“蜘蛛侠历险记”。“这是第一个充分集成了多媒体、实景、车载音响以及动感动态骑乘的景点，” Turner说道，“在哈利波特的魔法世界、上海迪士尼的加勒比海盗和其他完全身临其境的沉浸式骑乘游乐景点，我们目前看到的舞台早在20年前就奠定了基础。”随着迪士尼准备今年在阿纳海姆和奥兰多公园里新土地上应用星球大战IP，全世界的观众将会看到他们新的飞跃。在这些高度主题化、高度品牌化的空间中的沉浸感，包括有让游客更多互动参与，和将主题延伸到游客体验的更多集成元素中，比如零售、餐饮。

最终，在场地型娱乐体验空间中，IP通过提供体验、沉浸感以及深入的游客参与度带来价值并获得价值。“人们与IP形成的情感连接是主要推动力之一，” TPG的Jennifer Miller说道。Miller近期晋升为制作开发副总裁，她带来了25年全球成功项目的制作和项目管理的行业经验。“最终，使用哈利波特，或星球大战，又或是侏罗纪世界的心爱IP，让游客有机会身临其境体验到原本只在

书上文字、静态图像甚至是视听媒体的东西。这样的沉浸体验很引人注目。”

现场表演吧

沉浸式和互动式是主题公园和游乐景点的重要趋势，现场表演秀也同样盛行。“现场表演秀体验为那么多人参与的数字和在线体验创造了平衡，备受欢迎，” Miller说道。这个趋势越来越明显，更多的壮观秀和更多的沉浸秀使用一系列元素、多媒体和特效来吸引观众。这些秀满足多种需求，它们可以娱乐大量的人群，提供有参与度的坐席休息，覆盖广泛的人群并且增强公园或场馆的信息传递。

“随着大公园入园率继续增长将给景点容量带来压力，越来越多的大规模壮观秀将会出现，” Marks说道。

有个典型的案例就是《仙鹤芭蕾》，自2010年在新加坡圣淘沙开业运营以来，已成为一个不朽的夜间表演秀奇观。Chambers和Marks与娱乐设计公司的设计师Jeremy Railton合作，共同组建了這個开创性的表演秀（和爱情故事），该秀含有两个30米高的机械仙鹤，以及水效、灯光和音乐。该项目很大程度上激发了Chambers和Marks创建TPG公司，该项目也获得了TEA 2011年西娅大奖（主题乐园类的奥斯卡奖）。“TPG经常发现自己处于一次性的、前所未有的项目领域，正如我们做的《仙鹤芭蕾》，” Chambers说道，“景点行业总是被认为要超越自己，要差异化并且推出下一件，这样一来，过去的经验结合对过去成就的了解才是最有帮助的地方。”

主题乐园遍布全球

在世界各地，主题乐园被公认为一种可行的商业模式，有助于刺激发展和目的地旅游，并为区域人口提供更多的休闲和娱乐选择。东京迪士尼乐园，一个开创性的例子，是Frank Stanek在迪士尼担任高管期间协助开发的项目。它于1983年开业。“第一年我们有1000万入园人次，第五年入园人次达1700万，” Stanek说道。相比之下，他



The Dabangg: Stunt Spectacular Show at Bollywood Parks™ Dubai combines special effects and high-paced action with the dance and music aesthetic of traditional Bollywood films. *All photos, unless otherwise noted, courtesy of The Producers Group.*

extending the theming to integrate more elements of the guest experience, such as retail/food and beverage.

Ultimately, in the LBE space, the IP brings value and receives value through delivering experience, immersion, and a deep level of guest engagement. “The emotional connection that people form with an intellectual property is one of the primary driving forces,” said Jennifer Miller of TPG. Miller was recently promoted to Vice President of Content Development and brings 25 years of industry experience to the table with production and project management credits on projects all over the globe. “At the end of the day, using the beloved IP of Harry Potter or Star Wars or Jurassic World gives visitors the chance to immerse themselves physically in something that previously had only been words on a page, static images or even audiovisual media. And that’s compelling.”

Going Live

While immersion and interactivity form a significant trend for theme parks and attractions, live shows also continue to reign. “Live experiences create a welcome balance to the digital and online experiences that so many are involved in,” Miller said. The trend is toward larger, more spectacular and more immersive shows, using an array of elements, media and effects to envelop

audiences. These shows serve multiple needs: they can entertain large numbers of people, provide an engaging sit-down break, reach a wide demographic and reinforce the messaging of the park or venue.

“We will see more large-scale spectacles as high park attendance continues to put a strain on attraction capacities,” said Marks.

One leading example is Crane Dance, a monumental, nighttime spectacle, celebrated since opening at Resorts World Sentosa in Singapore in 2010. Chambers and Marks, working with designer Jeremy Raiton of Entertainment Design Corp., helped put together the groundbreaking show (and love story) with its two 30-meter tall cranes, water jets, lights and music. This project, which helped motivate Chambers and Marks to found TPG, went on to be honored with a Themed Entertainment Association (TEA) Thea Award in 2011. “TPG often finds itself in one-off, never-before-done project territory as we did with Crane Dance,” said Chambers. “The attractions industry is always being called on to top itself, to differentiate and roll out the next thing, and that’s where past experience and a knowledge of past accomplishments can be most helpful.”

引用了2005年开业的香港迪士尼，花了几年时间并重新投资才取得成功。然而，2016年开业的上海迪士尼，从一开始就被认为是成功的，其中归功于开发商采取的合作模式，将品牌加入区域敏感度。

中国庞大规模的潜在市场意味着将会有越来越多的乐园。“中国有超过3亿中产阶级，”Turner说道，“市场是支持这些大型乐园的。真正的问题是，市场是否接纳并且愿意支持这些乐园提供的更加高端的产品。”

鉴于市场的前景，有许多成功的案例以及质量的普遍上升趋势，不乏新老企业加紧迎接中国市场的风险和挑战。环球正在进行北京新建公园的设计和建设。亚洲很多其它的公园也在开发过程中。TPG在亚洲的客户包括恒大、海昌、长隆、上海迪士尼以及刚刚提及的环球影城北京度假区。

与此同时，阿联酋在快速发展的旅游市场过程中展现出自身独特的发展前景和动力。TPG在这个独特的市场领域参与的项目有《Dabangg: Stunt Spectacular Show》，该项目位于迪拜宝莱坞乐园。该表演秀包括现场特技演员，以及特技车辆、烟火特效等等。

迪拜的新公园入园人数将需要一段时间才能达到预期目标，将可能在2020迪拜世博会同期增长。“迪拜建了新公园和新景点来促进旅游业，而不是依靠现有和近期旅游市场需求，”Chambers说道，“我相信旅游人数会随着时间的推移而增加，这些项目也将随之获利。”

主题娱乐遍布各地

随着全球购物中心和商店在消费者行为转变的时代难以刷新定义，主题娱乐被视为遏制“零售危机”的一种有效方式。

“零售运营商正试图创造一个独特、有吸引力、高效的旅游目的地……不断发展来保持相关性和可取性，专注于购物者的个性化连接以

及技术创新，提供从实体购物至网购的无缝体验，”Miller说道，“随着购物商场为他们的地区带来越来越多的休闲娱乐选择，他们正开发综合功能的旅游目的地，可提供更高层次的休闲娱乐服务。”

用新想法填充这些空间不会在一夜之间完成，也并不是一切都会奏效。“我们设计界有个重要的焦点就是这些方向，”Stanek说道，“所有设计的经济性都需要进行一些实验来确定需要使用哪些可行的产品。”比如VR场地具有固定的容量问题，这是对经济可行性的挑战。Stanek建议购物中心可以很好的考虑、探索短期产品。“我们可能会看到这些地区的立体娱乐产品最多只有三到五年周期。”

采用这种新的商业模式会需要改变商场的文化和商场所有权。“想象一下，让你觉得有欲望每天或者一周要去几次这个商场，”Chambers说道，“去商场可能是日常生活的需求，比如，儿童和成人护理，牙医诊所，以及餐饮及娱乐。”

在餐饮方面，TPG拥有自己的专用产品，是与Premier Rides公司合作开发的，称为“奇异之旅®冒险餐厅®”，提供一种身临其境的用餐体验，将游客带到美妙的旅游目的地的，同时享用美味佳肴和饮料。还有现场的演员以及游客乘坐的“飞船”窗外的美景。

新一代的公园、景点、市场和游客

随着运营商不断进行再投资来保持游客的回头率，以及新商业模式、新市场以及新玩家的出现，“变”一直是主题娱乐行业的规律。

华特·迪士尼说他的公园一直都在变，“只要世界上还有想象力”。真正的问题是变的本质以及变的形式。

“如果处于一个成熟的市场，那么你必须做一些更具备区域吸引力的东西，或者足够大来吸引游客人数，”TPG顾问委员会成员Darrell Metzger说道。这包含他所说的追加销售：提出新概念来刷新刺激现有平稳的入园率，让游客有新的理由出

Theme parks everywhere

Around the world, the theme park is recognized as a viable business model to help stimulate development and destination tourism and provide more leisure and entertainment options to regional populations. Tokyo Disneyland, a pioneering example, was a project Frank Stanek helped develop while working as an executive at Disney. It opened in 1983. “We did 10 million in attendance the first year, and 17 million in the fifth year,” said Stanek. In contrast, he cited Hong Kong Disneyland, which opened in 2005, which took a number of years and re-investment to become an established success. For its part, Shanghai Disneyland, which opened in 2016, has been considered a success from the start, with credit given to the collaborative approach taken by developers, joining the brand to regional sensibilities.



The Fortune Diamond Show at Galaxy Macau

The sheer size of the latent market in China means there will be more parks. “China has over 300 million in the middle class,” said Turner. “The market is there to support these mega parks. The real question is whether that market is receptive and willing to support the higher end product these parks offer.”

Given the promise of the market, the many successful examples and the general upward trend in quality, there is no shortage of new and established players stepping up to embrace the risks and challenges in China. Universal is well underway with design and construction of its major new park in Beijing. Many other parks are in the Asian development pipeline. TPG’s list of Asian clients includes Evergrande, Haichang, Chimelong, Shanghai Disneyland, and the aforementioned Universal Beijing Resort.

Meanwhile, the United Arab Emirates (UAE) presents its own, unique development landscape and momentum in the quest to rapidly grow its tourist market. TPG’s work in this singular market sector has included the Dabangg: Stunt Spectacular Show that is part of Bollywood Parks™ Dubai [See “Family Friendly Bollywood,” InPark issue #62, May 2016]. The show features live stunt performers, along with careening vehicles, fire effects and more.

Attendance numbers for the new theme parks in Dubai are expected to take some time to reach initial projections, with a likely boost coming in tandem with Expo 2020 Dubai. “Dubai built its new parks and attractions to promote tourism, rather than for existing and near-term tourist market wants or needs,” said Chambers. “I have every expectation that the tourist numbers will rise with time to make those projects profitable.”

Themed entertainment anywhere

As shopping centers and stores around the world struggle for re-definition in an era of shifting consumer behavior, themed entertainment is seen as one way to stem the “retailpocalypse.”

“Retail operators are attempting to create a unique, attractive, efficient destination... evolving to remain relevant and desirable, focusing on personalized connections with shoppers and technical innovations offering a seamless physical-to-online shopping experience,” said Miller. “As shopping malls bring more recreation and entertainment options to their locations, they are reinventing themselves as mixed-use destinations with increased levels of leisure and entertainment offerings.”



Bob Chambers, Judd Nissen (TPG’s director of project development) and Ed Marks at the iconic entrance to Chimelong Ocean Kingdom while it was under construction.

Filling those spaces with new ideas will not happen overnight, and not everything will work. “A big part

来消费。他引用了新加坡动物园夜间野生世界，游客可以参观夜间醒来的夜行动物。“他们在每个站点都提供一次晚餐巡演。”

游览大型主题公园的费用也预示着一些消费模式的变化。“人们不会把钱都花在大公园，因此，他们会去家庭娱乐中心，” Metzger说道，“购物中心将会充满家庭娱乐中心，并成为购物、餐饮和娱乐活动中心。”

技术上日新月异的变化，导致主题公园设计其景点的方式发生变化。“技术让沉浸式体验的创建变得更加容易。有了智能手机引领的方式，交付方式每天都在发生变化，” Turner指出。

这项技术深受年轻一代欢迎，在日常生活随处可见。公园和其它娱乐中心正在寻求应用这项技术的方法，并将继续接纳新技术。“技术将永远青睐于下一代，他们是最容易接受新技术的群体，” Turner说道。

但是技术不仅仅适用于年轻人。“我们生活在一个人口老龄化的社会，25岁及以下的市场人口

比例在下降，而55岁及以上的人口比例正在上升，” Winslow说道。他认为黑暗骑乘的重现以及他们注重讲述故事（而不是激动人心的骑行）反映了这点。它们旨在吸引那些人群，同时也提供吸引年轻人的互动性和IP。

到亚洲，甚至更远！

建造主题公园的地方也在发生变化。不仅仅在中国，未来几年将在整个亚洲市场出现更多建造机会。“发展中国家有着巨大的机遇，” Stanek说道。他指出印度庞大的人口基数和相对尚未开发的市场，以及俄罗斯和南美洲。

能够适应这些变化并在变化中发展的主题娱乐公司，将在未来生存并取得成功。这意味着拥抱新的工具，包括完全沉浸式、VR(虚拟现实)、增强现实、互动机会，或者只是简单让人们外出玩耍、购物或吃饭的新方式。

“市场上越来越多主题娱乐选择，为我们和我们的设计师提供了更多工具，” Chambers说道，“无论我们走到了哪里，我都对公司的未来感到兴奋。...”



The Wishing Crystals at Galaxy Macau



Crane Dance at Sentosa Island, Singapore. Photo courtesy Entertainment Design Corporation.

of our design community is focused in those directions,” said Stanek. “The economics of all of this is going to take some experimentation to figure out which are the viable products to put in them.” Virtual Reality (VR) locations, for instance, have an inherent capacity issue that is a challenge to economic viability. Stanek suggests that shopping mall spaces might do well to explore short-term offerings. “We may see pop-up entertainment in these areas that have a life span of three to five years at the most.”

Adopting new business models of this kind will necessitate changing the culture of malls and mall ownership. “Imagine a mall that you feel a desire to visit every day or several times a week,” said Chambers. “It could include daily life needs such as child and adult care, dentist offices, along with dining and entertainment.”

On the dining front, TPG has a proprietary product of its own to offer, developed in partnership with Premier Rides, Inc. “Extraordinary Voyages® Adventure Dining®” is an immersive dining experience that will transport guests to fantastic destinations while they dine on delicious food and beverages. It will feature live actors and dramatic scenery outside the window of the “vehicle” they are riding in. [See “Napkin Sketch,” InPark issue #65, November 2016]

The next generation of parks, attractions, markets and visitors

Change is a given in the themed entertainment business, as operators continually reinvest to keep customers coming back, and new business models, markets and players emerge. It is how change is embraced that enables companies to move forward and stay in business. Walt Disney said his park would always change “as long as there is imagination left in the world.” The real question is the nature of that change and what form it takes.

“If it’s in a mature market, you have to do something that attracts the regional area more, or is big enough to bring tourists in,” said TPG advisory board member Darrell Metzger. That includes

what he refers to as upselling: coming up with concepts to refresh and renew existing locations where attendance has leveled off, giving visitors a new reason to come out and spend money. He cited Singapore Zoo’s night safari where visitors can take a tour when the nocturnal animals are awake. “They made it into a dinner tour with a course at each stop.”

The costs of visiting a large theme park also augurs a change in spending patterns, for some. “People can’t spend all their money on big parks, so they’re going to Family Entertainment Centers,” said Metzger. “Shopping centers will fill up with those and become activity centers with some shopping, dining and entertainment.”

Changes in technology lead to changes in the way theme parks design their attractions.

“Technology is making it easier to create immersive experiences. The delivery method is changing every day with smart phones leading the way,” notes Turner.

That technology is well embraced by younger generations, and is visibly seen in everyday life. Parks and other entertainment centers are finding ways to adopt that technology, and will continue to do so going forward. “Technology will always be focused on the next generation, they’re the easiest to train to use it,” said Turner.

But technology is not just for the young. “We live in a world with an aging population and the percentages of the market 25 and younger are going down, while the percentages that are 55 and older are going up,” said Winslow. He thinks that the resurgence of dark rides and their emphasis on storytelling (as opposed to thrill rides) reflects this – they are designed to attract that population while also providing the interactivity and IP that appeal to the younger set.

To Asia, and beyond!

Where theme parks are built is also changing. The next several years will see more opportunities in the Asian market, and not just in China. “Developing countries offer huge opportunities,” said Stanek. He points to India’s huge population base and status as a relatively untapped market, as well as Russia and South America.

Themed entertainment companies that can adapt and build on these changes will survive and succeed in the future. It means embracing new tools that include total immersion, virtual reality, augmented reality, interactive opportunities, or simply new ways of getting people to go out to play, shop or eat.

“More themed entertainment options in the marketplace gives us and our designers more tools to work with,” said Chambers. “I’m excited for the future of our business, wherever it takes us.” • • •



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All systems integrated

“The world’s largest exhibition for AV and integration systems” gathers in Amsterdam. InPark checks in on the annual expo and conference.

by Martin Palicki

AVIXA’s (Audiovisual and Integrated Experience Association) Annual ISE show (Integrated Systems Europe) returned to Amsterdam in February to showcase the latest technologies and ideas for the tech marketplace.

More than ever, AVIXA and exhibitors at the show are realizing the transformative effect AV is having on a variety of markets. As themed entertainment has expanded into retail, hospitality, museums and more, AV technology has been a partner in that process. That connection is apparent from the breadth of products available and from how exhibitors present them at the show.

ISE bills itself as “the world’s largest exhibition for AV and systems integration,” and the numbers appear to stack up. Over 81,000 attendees visited 15 halls (several of them temporary tent structures added on to Amsterdam’s RAI Center) to see the latest from 1,301 exhibitors. By comparison, 2018’s InfoComm in Las Vegas (also organized by AVIXA) saw nearly 43,000 attendees and 964 exhibitors.

While some areas target specific niche markets, such as conference rooms or home theaters, the vast majority of exhibitors are bringing products applicable to a variety of experiences. Many of them understand how valuable AV is to the modern attractions and guest experience landscape.

Media-based attractions are ubiquitous and rely on a wide range of AV technology, with big industry players always on the lookout for ways to enhance the guest experience, competing not only with other attractions, but also with in-home entertainment. Frequently, this means finding the latest technology in projectors and LED screens, which were in ample supply at ISE. More pixels, crisper resolution, higher lumens...it’s almost like the bigger, taller, faster roller coaster wars of the 1990s. Competition and advances in technology are also encouraging suppliers to create product versions at price points that encourage venues of all budget-sizes to look at how they can better integrate AV into their offerings.

Over 1,300 exhibitors spread out over 15 halls to welcome over 81,000 attendees to the 2019 ISE show in Amsterdam.





AV Stumpfl and VIOSO shared space to highlight the new Pixera product suite and Anyblend 5 software.

Here, then, is InPark's brief walk through the ISE expo, highlighting only a few of the many technology marvels on display.

AV Stumpfl

Austria-based AV Stumpfl is known for their projection screens, media servers and control systems. During ISE, their latest product suite, Pixera, was touted as allowing users to realize video content payout and projection mapping scenarios with a simple, intuitive user interface. "Pixera brings GUI (graphical user interface) out of 2000 and into 2019 and beyond," said AV Stumpfl Global Marketing Advisor Hans Stucken.

The Pixera GUI guides users through three main tabs. Every single tab allows for a different point of view and point of access to the overall creative setup. "Screens" offers users an overview of their project space where they can arrange their screens, LED walls, objects etc. "Mapping" is where warping, softedge adjustment and output routing happens. Within the "Compositing" tab, users can be creative and use content to create and program their shows. Live rendering allows for immediate feedback for the programmer for a professional finished product.

Pixera integrates with AV Stumpfl's suite of products and has a very flexible API, allowing it to work with other manufacturers' control systems and components, such as Medialon and Panasonic GeoPro. Pixera also simplified the process for mapping 3D objects. It is designed to serve a wide range of market verticals including theme parks, museums and visitor attractions.

"With Pixera we focused on creating ease and usability in a system designed for experienced professionals and those entering the world of professional video payout for the first time," said Stucken.

7thSense

UK-based 7thSense Design, known for the durable Delta media server product as well as other server and show control systems, debuted the new Pico server. Pico is smaller and ruggedized, making it ideal for dark rides or motion platforms. It integrates with the full line of 7thSense products.

7thSense also showcased their newest software, Compere, which oversees controls hardware, and can also be used for confidence monitoring. For example, within a multi-screen attraction Compere monitors what is happening in all the media, and includes a live feed of media, allowing operators to monitor the content remotely. It also provides easy and precise warping and blending, intelligently knowing where to combine images. In the near future, Compere will also be able to be used for system visualization.

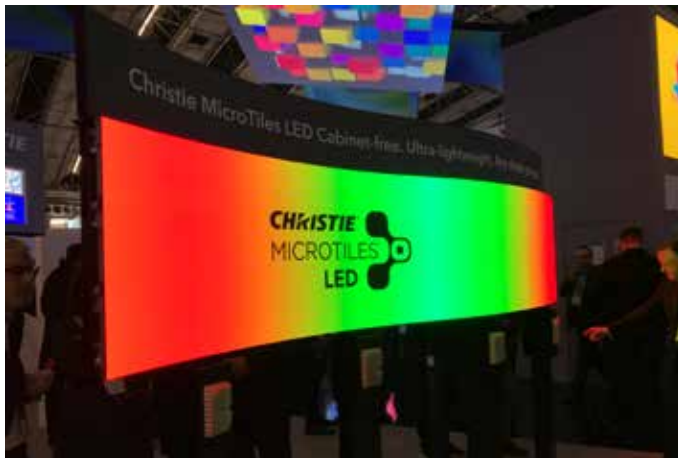
Powersoft Mover

Italy's Powersoft has a reputation for manufacturing pro-audio amplifiers. They transformed their existing technology into a new product line after learning The Lava Center in Iceland wanted to simulate an earthquake for guests. Powersoft created a 1.5 meter platform that can replicate earthquakes up to magnitude 6.0 on the Richter scale (though it typically operates at a 3.2 level). This was achieved through the use of M-Force, an innovative transducer based on a patented moving magnet linear motor structure developed by Powersoft for its amplifiers. The development of this system led the way to the creation of the Mover product line.

Similar to M-Force, Mover uses a moving magnet linear motor to create low-frequency vibration. The product began testing in September 2018 and has been available in the market since February 2019. Mover is designed for high efficiency and minimal maintenance. Some of the areas Powersoft anticipates the Mover will be popular include rides, VR systems, gaming, cinema, 4D attractions as well as in industrial applications.



The Powersoft Mover device, about the size of a Rubik's Cube



Christie's MicroTiles LED panels can be combined to make curved displays.

Christie

With offices in the USA, Canada and China, Christie is primarily recognized for their line of projectors and accompanying software and equipment. They have long been involved in the attractions marketplace, and have been focusing on specific product solutions for that space. Christie View (previewed by InPark during the IAAPA Expo 2018) allows up to four users to see different content on the same screen at the same time, each at 60fps, resulting in a total rate of 240fps. Christie View is expected to be available in May. Interest has predominantly been from the LBE market, although some film studios and gaming operators have also explored Christie View's possibilities.

The D4K40-RGB pure laser projector enjoyed its European debut during ISE. In addition to its unique, all-in-one design and the advanced high frame rate and color capabilities, the projector can be oriented in any direction and only requires single phase power. As we mentioned in our April 2019 article on RGB laser projection, ["Christie: Screens to fill, markets to disrupt," InPark issue #77] a most important attribute is that RGB laser technology facilitates a leap forward in the color space a projector can produce. The ability to support the expansive Rec. 2020 color palette is something to delight audiences with visual richness and range (think art and nature) – while also able to fulfill business needs with its precision (think branding and IP).

Meanwhile, the beloved Christie MicroTiles have been re-engineered as MicroTiles LED [see page 76]. The new MicroTiles LED route both signal and power through a single PoE Cat6 Ethernet cable. MicroTiles LED have been designed to eliminate alignment requirements, drastically increasing installation speed. The tiles communicate to one another to automatically match color and brightness across the wall. Displays can be designed in nearly any configuration, including convex and concave walls or 90-degree inside and outside corners.

Barco

Belgium-based Barco offers a wide line of projectors, LED screens, image processing and visual display systems. Through an acquisition, they also offer Medialon show controls, popular

with the attractions industry. At ISE 2019 Barco introduced its brand new G60 series of one-chip laser phosphor projectors. Available in 7,000-, 8,000- and 10,000-lumen versions the G60 is designed to create straightforward and cost-effective displays while enabling existing lenses to be re-used. At the same time, Barco has nudged up the brightness of its industry-leading F80 one-chip laser phosphor range, adding a 12,000 lumen version with the same vivid, 4K color quality. It's all part of Barco's goal of providing ever greater brightness from the same technology, "without compromising on color quality, footprint, noise or price."

Higher up the Barco range the same process is happening. Barco's established three-chip laser phosphor large venue projector, the UDX, is already popular for building-mapping, concerts, arenas and sports events. Now the UDX has been upped to a maximum of 40,000 lumens. Later this year Barco plans to bring out a new UDX series with a brightness of around 14,000-22,000 lumens. This new range will be compact, about half the weight of today's UDXs, and at a competitive price point.

VIOSO

With a home office in Germany, VIOSO has a product suite of both hardware and software solutions designed to simplify the projector alignment and calibration process. During ISE, VIOSO released Anyblend 5 – its latest software to automatically align projection systems, thanks to new patented algorithms. With the help of a standard camera, VIOSO Anyblend is able to convert an image seen by the camera in 2D into a 3D surface. How does it work? Projected dots create splines and the camera essentially 'connects the dots.' The camera is then able to identify the specificities of the 2D view and uses an advanced method to build a spline based on what the dot pattern should look like. The result is a better and smoother projected content on any 3D surface.

Barix

Based in Switzerland, Barix manufactures a full line of audio solutions products, with an emphasis on audio distribution and paging systems. During ISE Barix presented a new concept coming to market: The Paging Cloud. Expected later this year the system uses existing paging systems to broadcast to mobile phones. The device "hears" a page, records it and then forwards it to the cloud. Guests then receive a notification on their phone, and click a link to listen to the message.

Guests opt in to the program and the small box doesn't change anything operation-wise for the attraction. Barix is keen on hearing from people who want to run a trial – especially amusement park operators. • • •

ISE returns to Amsterdam February 11-14, 2020 before relocating to Barcelona February 2-5, 2021.



think spectacular

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Birth of Planet Earth

New Spitz release “Birth of Planet Earth” explores the celestial events that prepared Earth for supporting life

by Joe Kleiman

Spitz Creative Media has begun distributing the new show “Birth of Planet Earth” to digital fulldome theaters worldwide. Produced in partnership with the National Center for Supercomputing Applications Advanced Visualization Laboratory (NCSA AVL) and Thomas Lucas Productions, Inc., “Birth of Planet Earth” travels through more than one hundred million years of our planet’s history to explore the origin of life on Earth. The show draws upon the latest scientific ideas, supercomputer computations, and state-of-the-art visuals to give a better understanding of why, in our search of the universe for exoplanets - planets orbiting other stars - we have yet to find one that shares the same size, tilt, orbit, and distance from its sun as the Earth – necessary attributes that all contributed to the evolution of life on our planet.

“Birth of Planet Earth” marks the fourth collaboration between the production partners, following *Black Holes: The Other Side of Infinity*, *Dynamic Earth*, and *Solar Superstorms*. The collaboration had its origins in a PBS/Nova documentary about black holes that producer/director Thomas Lucas was working on with Dr. Donna Cox and her group at the AVL. “Mike Bruno at Spitz persuaded us that the story would really come alive and gain wide exposure in a giant screen fulldome version.”

Visualizing scientific data

Located at the University of Illinois at Urbana-Champaign, the AVL under Cox’s direction is known for taking computational data and redefining it into high-resolution cinematic-quality visuals for public consumption. As Lucas describes it, “The visualization of science through supercomputing resources provides a level of detail and dynamism that’s ideally suited for fulldome presentation.”

According to Cox: “One of the reasons that “Birth of Planet Earth” is unique, is because of the production-quality data visualizations developed by our group. Our AVL team worked iteratively with teams of scientific researchers to transform billions of numbers from computational data into stunning visual scenes for “Birth of Planet Earth.”



Theia slams into the Earth. Earth will soon be enveloped in vaporized rock, some of it hotter than the surface of the sun.

Credit: Robin Canup, Southwest Research Institute. Visualization by Advanced Visualization Lab, National Center for Supercomputing Applications, U. of Illinois.

Start at the end

As a filmmaker, Lucas always looks for the core idea on which to base the story. In the case of “Birth of Planet Earth”, he found that core in an AVL visualization that he had heard about for years – a flight through primitive bacteria. Once he saw the animation in person, he began to understand its meaning: “The animation of the primitive bacteria shows an energy path of a photon hitting a cell, converting into another form of energy. It was photosynthesis in its most primitive form. Photosynthesis produced oxygen, and oxygen changed the composition of our planet. Life is what turned this planet from a rocky, toxic outpost to Earth as we know it now.”

Lucas would use the advent of photosynthesis as the conclusion to his fulldome show. The lead-up beckons audiences to ask a single question: “Did the Earth have to turn out this way... or was it somehow a fluke?”

Animation problem solvers

Mike Bruno, Media Director for Spitz Creative Media recalls the early days of the collaboration: “We first worked with Donna Cox’s team at NCSA’s Advanced Visualization Lab on ‘Black Holes: the Other Side of Infinity,’ the 2006 Denver Museum of Nature & Science production. NCSA was contracted to produce the majority of the visuals for this show. Tom Lucas, the writer/director, hired Spitz to create a special-effects shot of several kayakers plunging into a waterfall, as an analogy for falling into a black hole. In the process, we all got to know each other and later (2012) co-produced ‘Dynamic Earth: Exploring Earth’s Climate Engine.’ It has been booked in around 200 domes and translated into numerous languages.”

For “Birth of Planet Earth,” animation duties were split between Spitz and the AVL. “The Spitz Creative team,” says Lucas, “is steeped in visual effects and high-end animation production.” Lucas would construct the film as a back-and-forth between Spitz Creative’s dramatic and realistic animations and the simulations

The Advanced Visualization Lab at NCSA

To communicate science to the public, NCSA's Advanced Visualization Laboratory (AVL) works in close collaboration with domain scientists to create high-resolution, cinematic, data-driven scientific visualizations for planetariums, museums, IMAX films, and TV documentaries. Currently, AVL is leading a National Science Foundation-supported project to inform the public about computational and data-enabled scientific discovery. This project - called CADENS (The Centrality of Advanced Digitally ENabled Science) - is co-producing ultra-high-resolution digital documentaries for fulldome theaters and high-definition documentary programs for online and television distribution.

The AVL is led by Dr. Donna Cox, who has received international recognition for founding in 1988 the concept of "Renaissance Teams" of interdisciplinary collaborators to solve challenging problems. The AVL is one such "Renaissance Team," where each member of the team plays a unique role and contributes a variety of skills to the process, development, and production. Robert Patterson (designer, filmmaker), Stuart Levy (computer scientist, astronomer), AJ Christensen (computer scientist, designer), Kalina Borkiewicz (computer/data scientist) and Jeff Carpenter (multimedia, graphics artist) combine their expertise, which includes advanced graphics and visualization techniques, artistic design, cinematic choreography, multimedia and video production, and data management and render wrangling.

Cox is an internationally acclaimed computer artist, designer, writer, and recognized ground-breaker in the art of scientific visualization. Cox's work is best known for her pioneering use of data visualization and supercomputing. In February 2017, the IMERSA (Immersive Media Entertainment Research, Science, and Art) international organization awarded Cox with a lifetime achievement award for lasting and positive contributions to the digital dome and big screen community.

Dr. Cox strives for blending scientific accuracy with artistry. She and AVL collaborate with science teams and technologists to create cinematic presentations of scientific data and concepts. Together, they have created and directed a large body of compelling work in the cinematic presentation of scientific numerical data, thrilling millions of people worldwide. AVL's latest popular production includes the "Solar Superstorms" fulldome documentary narrated by Benedict Cumberbatch (2015). Cox and AVL created the opening and closing shots for "A Beautiful Planet" (2016), an IMAX 3D movie narrated by Jennifer Lawrence. They created a virtual flight through Hubble data that comprised a significant portion of the Hubble IMAX 3D film that premiered at Smithsonian's National Air and Space Museum in March 2010. The film won three Giant Screen Cinema Association Awards for best film, best film for life-long learning, and best cinematography. AVL has created production-quality visualizations and co-produced other successful fulldome shows including "Black Holes: the Other Side of Infinity" and "Dynamic Earth." •



In the first 24 hours, some of the collision debris coalesces into what will become the Moon. Remaining material will swirl around Earth for as much as a century, gradually accumulating onto the Moon, or falling back to Earth. *Credit: Robin Canup, Southwest Research Institute. Visualization by Advanced Visualization Lab, National Center for Supercomputing Applications, U. of Illinois.*

of the Advanced Visualization Lab, creating a visual dialogue between the two visualization styles.

The Grand Tack

Utilizing hydrodynamic simulations, which the AVL visualized for the film, Kevin Walsh of the Southwest Research Institute and his collaborators showed that through a concept known as “The Grand Tack” (named after the sailing term for the action a boat takes as it turns its bow into the wind), Jupiter moved toward the inner solar system, disrupting the orbits of the developing inner planets. Jupiter eventually returned to the outer solar system, drawn by the gravity of another developing giant – Saturn. During the Grand Tack, Jupiter’s gravitational pull caused a number of the inner planets to be ejected from the solar system, while others collided and broke apart. These effects reduced the mass of the inner solar system, ensuring that smaller planets would survive and dominate.

Spitz, Inc.

A fully owned subsidiary of Evans & Sutherland, Spitz, Inc. is located in Chadds Ford, Pennsylvania, about 45 minutes west of Philadelphia on US Route 1. Its 47,000 square-foot facility is home to over 50 fulltime employees.

The expertise of Spitz’s talented team covers all aspects of dome theater design, implementation, and use, including engineering services, manufacturing, installation and show production through Spitz Creative Media.

As a complete integrator of planetarium and spherical projection theaters, Spitz provides display systems, automation, lighting, audio and design/engineering services. Its architectural services include design, fabrication and installation of some of the most innovative dome structures in the world.

Founded in 1947, Spitz began as a provider of affordable optical planetarium projectors for schools and small educational institutions. Since then, Spitz has grown to become a world leader in projection domes, with more than 2,000 installations worldwide. The Spitz projection dome customer list includes Disney, Universal Studios, Volkswagen, Griffith Observatory, and Zeiss.

Despite enormous growth throughout its 70+ year history, Spitz has continued to maintain its focus on educational products and services. •

The collision with Theia

Millions of years later, two surviving planets would cross paths... the young Earth and a neighboring proto-planet known as Theia. As the smaller Theia slammed into the Earth, it would explode into an atmosphere of vaporized rock hotter than the surface of the sun. What debris did not fall back to earth orbited the planet for as much as a century, gradually accumulating onto the Moon. Theia’s remains mixed with Earth and became part of the Earth-Moon system.

Dr. Cox of the AVL shares: “Dr. Robin Canup of the Southwest Research Institute computed the astrophysics for this crucial moment in the formation of the earth-moon system. Her numerical model generates numbers that describe the physical dynamism of the collision that formed the moon. The AVL transformed Dr. Canup’s numerical data into a dynamic, stunning visualization of this seminal event.”

According to Dr. Canup, the formulation of oxygen molecules found in moon rocks brought back by the Apollo missions is identical to that found in rocks on Earth. This correlation does not exist with meteorites that have impacted Earth, granting credence to the concept that the Moon and Earth have a shared genesis. The collision also tilted the Earth on its axis at 23.4 degrees, which is responsible for our modern seasonal changes as the Earth revolves around the sun.

Making science accessible

“Birth of Planet Earth” provides audiences with an array of important scientific concepts presented in an easy to understand and enjoyable format. According to Spitz’s Bruno: “We’ve done

Thomas Lucas Productions, Inc.

Thomas Lucas is a New York-area filmmaker whose most recent work includes such fulldome productions as “Supervolcanoes,” “Dynamic Earth,” and “Black Holes: the Other Side of Infinity,” partnering with Spitz Creative Media, Mirage 3D, and the Denver Museum of Nature and Science. He also produced “Solar Superstorms,” collaborating with the National Center for Supercomputing Applications and Spitz Creative Media.

Lucas has produced dozens of national and international science productions in collaboration with PBS, the Science Channel and National Geographic Television. He is a co-founder of Alliant Content, which distributes content to online platforms such as Amazon and PlutoTV. The group has released its own branded global digital network, MagellanTV, available on Roku, Fire TV, Android, iOS, and Comcast, and to be released soon to smart TVs. •



Above: “Birth of Planet Earth” enjoys its premiere in Berlin’s Zeiss-Großplanetarium in late March 2019.

Below: Brad Thompson from Spitz Creative Media and Kalina Borkiewicz from the AVL, representing the production team at the world premiere.
Photos courtesy of Stiftung Planetarium Berlin / F.M. Arndt

extensive testing with school groups, teachers and general public audiences in several locations. “Birth of Planet Earth” seems to resonate well with grade 6 and older, though even younger kids love the visuals, especially the Theia-Earth impact sequence.

“Our museum partner is the Tellus Science Museum in Georgia. David Dundee (planetarium director) and his team are producing a teacher guide and STEM curriculum resources. They are terrific collaborators and have tremendous experience with outreach education, and expert at creating materials that help teachers and students maximize their planetarium field trip experience.”

International reach

Narrated by Richard Dormer (Beric Dondarrion on the hit HBO series “Game of Thrones”), the 24-minute show is being distributed internationally in a number of languages. “We are just starting to roll it out and were really delighted to see it premiere in Berlin,” says Bruno. “We have lots of interest and a number of other school and museum bookings here in the U.S. The Eugenides Foundation planetarium in Athens, Greece will open the show in the fall.”

Following its world premiere at Berlin’s Zeiss-Großplanetarium in late March 2019, the planetarium’s Director, Tim Florian Horn, commented: ““Birth of Planet Earth” looks at the very beginning of our planet and the unique requirements that

enabled life to evolve. The new program helps us to develop a better understanding of the history of our very own existence on this pale blue dot we call home.”

Lucas sums up the film this way: “One of the big revelations of the search for extra-solar planets is that most solar systems don’t look like ours. There are lots of Neptune size planets, for example, within the inner solar systems. In this modern age of planet hunting, there’s something people don’t necessarily ask. Is our Earth a commonplace planet in a galaxy teeming with life, or is it a rare oasis in a barren universe?” • • •



TEA SUMMIT



Lisa Passamonte Green, Phil Hettema, Monty Lunde, Susan Bonds and Dave Cobb led a panel on submitting Thea Award nominations.
All photos courtesy of TEA.

Story rides high on the latest tech tools

By Joe Kleiman

The 2019 recipients of TEA Thea Awards for Outstanding Achievement shared a common trait – the use of technology as a tool to convey a story or evoke emotion.

“Technology is becoming a bigger part of the experiences created for themed entertainment related attractions and events,” said Technifex president Monty Lunde, founder of the TEA.

But... “Technology is not necessarily the driver,” said Lunde, “in that what we ultimately do, as an industry, is convey stories to guests. Advancements in technology give us more tools to affect what guests perceive and how they feel, while they experience our events, spectacles and attractions. As show related technologies continue to improve, so does our ability to tell even more compelling stories.”

Within that context, there is plenty of variety in how and what stories are told, and how technology is applied. Based on the recipients’ presentations at Thea Awards Case Studies Day (part of the annual TEA Summit preceding the Thea Awards Gala, at Disneyland Hotel in April), we noted some of these variations.

Be Washington and Nemo & Friends SeaRider variability leads to repeatability

Technology can enable guests to have a different experience each time they visit an attraction, providing new paths for guest engagement.

George Washington’s Mount Vernon created Be Washington: It’s Your Turn to Lead as an interactive experience that can be experienced three ways - as a scholastic version, which can be facilitated by an educator inside a classroom, an online version, and the physical manifestation of the project – a themed hall at Mount Vernon built in a space once used for distance learning.

The focal point within the Mount Vernon attraction is a 6K screen, 5760 x 1440 pixels. Be Washington confronts the players with four different real-life scenarios that George Washington faced in his presidency. The drama unfolds via high definition media produced by Cortina Productions. Historic figures give advice and new information. At the conclusion, participants’ decisions are compared to those George Washington made. The combination of multiple live participants playing together and the choice of scenarios means that no two experiences are the same.

2019 TEA Thea大奖： 最新技术工具带来的故事腾飞

作者：Joe Kleiman

2019 TEA Thea杰出成就奖的获奖者有一个共同的特点 - 将技术作为故事呈现或者唤起情感共鸣的工具。

在那种情况下，故事的讲述方式和内容，与技术的运用方式各有不同。根据获奖者在Thea Awards案例研究会（其作为TEA峰会的一部分，在Thea Awards颁奖晚会之前，于4月份在迪士尼酒店举行）上的展示，我们注意到其中一些变化。

成为华盛顿与海底巡游船：尼莫&好友的海洋世界——可变性通向可重复性

技术可以为游客每次的景点游览创造不同的体验，为游客提供新的参与方式。

乔治·华盛顿的弗农山庄创作的“成为华盛顿：该你来领导了”互动体验，可通过三种方式体验——其一是课室内教育者可采用的学术版；其二是在线版；最后是通过该项目的特色——在弗农山庄曾用于远程学习的空间内建造的主题馆。

弗农山庄景点的焦点是6K屏幕。“成为华盛顿”为玩家设置了乔治·华盛顿总统任职期间四个不同阶段的真实情节。故事通过由Cortina Productions制作的高分辨率媒体内容展开。最后，参与者的决定将与乔治·华盛顿所做的历史抉择进行对比。

在地球的另一端，东京迪士尼海洋将其移动仿真游乐设施风暴骑士，根据迪士尼皮克斯动画寻找尼莫和续集，改造成尼莫&好友的海洋世界。

可变性有多种实现方式。该游乐设施分成了多个章节，每个章节都有一些可以组合使用的可能场景，每个场景的帧数完全相同。

Bazyliszek，正义联盟：大都市之战与华强方特的东方神画——室内游乐设施新玩法

触手可及的技术和富有创意的外部团队为小型公园们带来了高端的故事讲述体验。

波兰Legendia主题公园在寻求室内景点的突破，一方面是庆祝60周年，另一方面是为该物业全年的营运过渡提供帮助。公园与Alterface和Jora

Vision联手创建了Bazyliszek，一个以波兰神秘生物为主题的互动媒体型室内游乐设施。在不使用立体3D的情况下，运用交换的技巧创造深度感，例如屏幕上的视角变换，还有与投影映射配合使用的黑光。

六旗神奇山的正义联盟：大都市之战标志着该景点在六旗公园的第七次安装。每年该景点都会开放一个新版本，由Sally Corporation带领的外部团队因地制宜，并通过其他方式增强体验。据Sally的Rich Hill说，一个关键的区分在于物理布景是搭建在360度环境内的。

据华强方特尚琳琳女士介绍：“我们想要开发突出中国文化的高科技主题公园。”中国厦门方特东方神画的重点，是数个讲述中国民间传说的高科技媒体型景点。“选择故事的时候，我们一般关注两点。”尚琳琳说：“故事能否与当代观众产生共鸣？故事能否用现代技术呈现？”除了两个多屏的室内游乐设备，该公园有一个全穹顶的特色剧场，剧场内的地板可以升降和翻转；还有中间设有四面AR展示的大型礼堂。

奇妙旅程和Intel Shooting Star - 表演中的无人机

无人机现已应用到现场表演，创造了灯光和表演平台的新风格。

最新的公主号邮轮，盛世公主号，是首艘专为中国市场量身打造的国际豪华邮轮。以中国丰富的史诗视觉叙事传统为灵感，其标志性表演奇妙旅程的核心是一系列旋转门。据该表演的导演Danny Teeson讲述：“门的一侧是由LED面板组成的，另一侧的白色表面可用于投影。”

该节目还选用了32台无人机，每次演出有14台在现场演员的周围飞舞——目标是消除舞台和观众之间的鸿沟。

从超级碗到奥林匹克运动会，Intel Shooting Star无人机在世界范围内担任着重要角色。

每台Shooting Star无人机都配有四芯片LED，可以有多达四百万种颜色的组合。此外还有一个较小

On the other side of the globe, Tokyo DisneySea has repurposed its StormRider motion simulator ride as the new Nemo & Friends SeaRider, based on the Disney-Pixar animated film “Finding Nemo” and its sequel. It (virtually) shrinks park guests within a fish-shaped vehicle, from which they observe (digitally animated) sea life up close.

Variability is provided in multiple ways. The ride is broken up into chapters, each with a number of possible scenarios that can work in combination, each having the exact same number of frames. According to Roger Gould of Pixar, creating the film was a special challenge as each chapter had to tie in seamlessly with the ones bookending it, without the advantage of cuts or effects-based transitions. Since the front of the SeaRider vehicle has a proscenium window in front of the curved screen, those guests riding in the front are able to see additional imagery to the left and right, while those further back can enjoy synched animation on a series of new monitors that run the length of the cabin.

Bazyliszek, JUSTICE LEAGUE™: Battle for Metropolis and Fantawild Oriental Heritage *new tricks for dark rides*

Accessible technology and highly creative external teams bring high-end storytelling experiences to smaller parks.

With a population of 40 million in its market, Polish park Legandia sought a breakthrough indoor attraction to mark its 60th anniversary and help transition the property to year-round operation. The park partnered with Alterface and Jora Vision to create Bazyliszek, an interactive media-based dark ride themed around a mythical Polish creature. Existing characters from throughout the park were also given a new boost, integrated into the attraction as sidekicks. Without using stereoscopic 3D, tricks of the trade were used to create a sense of depth, such as a perspective shift on screen and the use of black light with projection mapping.

JUSTICE LEAGUE™: Battle For Metropolis at Six Flags Magic Mountain marks the attraction’s seventh installation at a Six Flags park. Six Flags enlisted an external creative team led by Sally Corporation to develop and customize each installation. According to Rich Hill of Sally, a key differentiator is that physical sets are built in a 360-degree environment. The ride is also designed to evoke some of the thrills of Six Flags coasters, such as a simulated corkscrew twist in a subway and a 360-degree loop created by Green Lantern’s ring. [see page 47]

At the heart of Fantawild Oriental Heritage park in Xiamen, China are several high tech media-based attractions telling great stories of Chinese folklore. According to Fantawild’s Daisy Shang, “We wanted to develop a high-tech theme park highlighting Chinese culture. In choosing our stories, we looked at two things. Do the stories connect with a modern audience? Can the story be displayed with modern technology?” In addition to two multi-screen dark rides, the park features a fulldome

theater where the floor rises and rotates, as well as a large auditorium featuring a four-sided AR presentation in the center.

Fantastic Journey and Intel Shooting Star *drones in the show*

Drones are being integrated into live performances, creating new types of lighting and show platforms.

Princess Cruises’ newest ship, the Majestic Princess, is the first new international luxury cruise liner tailor-made to cater to the Chinese market. Using China’s rich heritage of epic visual storytelling as inspiration, a key storytelling device of its signature show, Fantastic Journey, is a series of rotating doors. According to Danny Teeson, the show’s director, “One side of the door is made up of LED panels, the other is a white surface that we projection map on. We share the stage with two other shows, both of which have large, three-dimensional sets, so it was important that we minimize our sets, but still pack a punch.”

The show also utilizes 32 drones, 14 in each performance, that dance in the air around a live performer – the goal being to abolish the divide between stage and audience. Because the drones are mapped into fixed locations inside the theater, located inside the center of one of the world’s largest cruise ships, the show’s production crew has begun utilizing their position relative to the stage to determine the wave conditions outside the ship.

Intel Shooting Star Drones have been featured worldwide from the Super Bowl to the Olympics. At Travis Air Force Base near Sacramento, California, the drones served as an alternative for a traditional fireworks show [see inparkmagazine.com/travis-afb-

Intel’s Daniel Gurdan shows a Shooting Star Mini drone, with a soft cage and propellers.



的室内版本，Shooting Star Mini，重量仅为40克。当然，安全性是设计时首要考虑的因素，因此有很多内置的保护机制。

乐高之家和摇滚巨轮——新型结构

根据乐高积木设计的真实建筑和基于DNA结构的旋转水道是独特建筑方法应用的点睛之作。

乐高之家是乐高集团的官方品牌中心，位于丹麦比隆，提倡通过互动或者“寓教于乐”促进认知发展。该建筑的外观就像由21块乐高积木堆叠而成的比例模型。建筑内有4个区域，每个区域都提供不同的玩乐方式。此外还有13个室外游乐区域。

2012年，一个来自瑞士的男孩设想了一个水滑梯，其形状类似于一个连接在转轮上的DNA链螺旋结构。2013年，水上乐园供应商Wiegand Maelzer获得了该项专利，并作为摇滚巨轮销售。长隆集团为其位于中国广州的长隆水上乐园购买了第一个生产模型。当24米高的巨轮旋转时，浮筏在不同的轨道间来回移动；任何给定时间内，摇滚巨轮最多可有3个浮筏。

埃维尔·克尼维尔博物馆和骆驼铃声——将历史带进生活

无论预算高低，新体验都将带领游客展开非凡的历史之旅。

埃维尔·克尼维尔博物馆的起源是堪萨斯州托皮卡帕特森家族经营的哈雷戴维斯特许经营店。可接触到Lathan McKay的世界上最大的克尼维尔藏品之一，经销商建了两个故事博物馆，面积为16000平方英尺。博物馆多媒体活动的亮点是VR摩托车跳跃，在托皮卡市区用了真正的特技骑手进行拍摄。游客们骑着摩托车，身穿VR装备，准备再次创造一个克尼维尔式的跳跃。

再创造是中国华夏文旅西安度假区骆驼铃声的核心：大型穹顶的下面，是表演中心的3000个坐席的观众看台，看台可以旋转并沿着穹顶移动，将游客带到六大讲述唐朝丝绸之路的场景中去。整个旅程下来，游客将体验4000平方米大的LED屏，2000吨的瀑布，骆驼，狼和上千人的演员团队。（详情请看InPark第76期“传奇，骆驼与安恒利”）

启示：人类/自然与火山湾——向本土传统文化致敬



通过技术的特殊应用，项目在向土著居民致敬。

作为加拿大建国150周年庆典的一部分，班芙艺术与创作中心与加拿大艺术家Sarah Fuller和总部位于蒙特利尔的Moment Factory强强联手，创作了启示：人类/自然活动。该活动在加拿大最古老的国家公园，历史上的土著居住地——亚伯达班芙，以及安大略省多伦多附近最新的红河谷国家公园举行。在限定的活动时间内，小组参与者将灯笼、投影机和其他工具带到荒野，寻找线索，因为他们要把线索拼凑成一个讲述人类与自然关系的故事。

环球影城的火山湾水上乐园并不是以任一土著居民文化为主题，而是向整个南太平洋所有的波利尼西亚团体致敬。整个公园的建筑采用了环太平洋地区真实的建筑元素。（详情请看InPark第77期“荣誉的爆发：环球影城火山湾荣获TEA Thea奖项”）

森大厦数字艺术美术馆和环球影城奇观夜间游行——故事讲述超越投影映射

对两个日本项目来说，投影映射仅仅是开始。

虽然投影映射已在全球范围内普及，森大厦数字艺术美术馆更胜一筹。占地面积100,000平方英尺，有5个独特的区域，可与动画互动，在不同区域间自由转换，与其他动画互动甚至融为一体。动画的任意性有时会产生截然不同的结果。

日本大阪的环球影城内，奇观夜间游行运用了54台投影机，投射在多栋建筑的表面，每个巡游单元都有不同的投影内容，营造的3D氛围作为花车的延伸。无论如何，投影映射是一种用于帮助制造氛围和讲述巡游故事的工具。与很多今年开放的项目一样，环球影城的巡游包含了多种元素，整条巡游路线上没有任何两处地方的体验是一样的，提升了游客多次访园的可能。...



Kerry Lovegrove from Princess Cruises highlighted some of the challenges in creating a technology-heavy show for a cruise ship.



Rainer Maelzer (l) from wiegand.maelzer explained SlideWheel, which was first built at Chimelong, represented by Chris Ho (r).

intel-drones]. Within the theme park community, the Shooting Stars have been seen in “Starbright Holidays” at Disney Springs, Walt Disney World Resort, and most recently during “Dark Arts at Hogwarts” at Universal Studios Hollywood.

Each Shooting Star drone features a four chip LED capable of up to four million color combinations. There is also a smaller indoor version, the Shooting Star Mini, weighing in at 40 grams. Safety is, of course, a design priority and there are numerous built-in safeguards. Ani Nanduri, vice president and GM of the Intel Drone Group, told InPark that the biggest obstacles they encounter with flying the drones tend to be radio interference and the aerospace regulations. “The drones are aircraft,” he said, “and regulations differ from country to country. Sometimes we have to film the flight beforehand, like at the PyeongChang Winter Olympics. We would not have been able to fly the drones live over the ceremony because we would have been flying over people and that would have been a violation of the local flight restrictions.”

LEGO® House and Slidewheel *new types of structures*

A real-life building designed with LEGO® bricks and a rotating waterslide based on the structure of DNA highlight unique approaches to architecture.

LEGO® House is the official brand center of LEGO Group. Located in Billund, Denmark, which is also home to the original LEGOLAND® Park, operated by Merlin Entertainments, LEGO® House promotes cognitive development through interactivity, or “Learning through Play.” The building’s architecture was developed with a scale model comprised of 21 LEGO® bricks stacked in an offset formation. Within the building are four zones, each offering a different approach to play. There are also 13 outdoor play areas. Being oriented to lifetime learning, the activities appeal to adults as well as children

and the attraction has developed a successful side business catering to meetings and conferences, especially those involving team building.

As the SlideWheel story goes, a boy in Switzerland sat on his father’s lap watching a documentary about DNA. He imagined a waterslide shaped like a DNA helix structure attached to a rotating wheel, eventually leading to a patent on the idea in 2013. The patent was licensed by waterpark supplier wiegand.maelzer and marketed as the SlideWheel. Chimelong Group purchased the first production model for its Chimelong Water Park in Guangzhou, China. As the 24-meter tall wheel rotates, rafts move back and forth between chambers, with up to three rafts inside the SlideWheel at any given moment. The SlideWheel was given the iconic place of honor at the center of the waterpark, and plays a double role as a visual spectacle, with a kinetic nighttime persona thanks to a package of more than 700 LED lights.

Chimelong was the first to adopt the SlideWheel, but we can expect to see more in coming years; WhiteWater West has partnered with wiegand.maelzer to become a licensed SlideWheel supplier.

The Evel Knievel Museum and Legend of Camel Bells *bringing history to life*

Whether low- or high-budget, new experiences take visitors on extraordinary journeys through history.

The Evel Knievel Museum is an extension of a Harley Davidson dealership run by the Patterson family in Topeka, Kansas. With a reputation for restoring vintage motorcycles, the dealership took on its biggest project to date – the restoration of Big Red, renowned stuntman Evel Knievel’s big rig truck. With access to Lathan McKay’s collection of Knievel memorabilia, one of the world’s largest, the dealership built a 16,000 square



ACE's Bingo Tso gave a detailed account of the audio systems required for the complex rotating theater of Legend of Camel Bells.



Attendees at the TEA Summit Day 2 took notes and enjoyed information on some of the industry's most fascinating projects.

foot, two story museum. Dimensional Innovations developed interactives for the museum, which include a “Bad to the Bones” exhibit, where visitors can examine all the ways Knievel broke his bones, including 40 X-ray images, and a Jump Planner (both activities meet STEM requirements). The interactive highlight of the museum is a VR motorcycle jump using media filmed in downtown Topeka with a stunt rider. Visitors mount a motorcycle and don VR gear as they prepare to recreate one of Knievel’s jumps.

Re-creation is at the heart of Legend of Camel Bells, at Huaxia Cultural Tourism Resort in Xi’an, China. Housed under a giant dome, the centerpiece of the show is the 3,000-seat grandstand, which rotates and travels the length of the dome, bringing the audience to each of the six large set pieces that tell the story of the Silk Road during the Tong dynasty. Throughout the journey, visitors experience a 4,000 square meter LED screen, a 2,000-ton waterfall, camels, wolves, and a cast of thousands. As the grandstand rotates within the structure, sound emanates from speakers embedded both in the grandstand and in each of the sets. Additionally, two center channels hang from each end of the ceiling, with one set of speakers always above the grandstand. The end result is that no matter where the grandstand is in the dome, the audience always experiences 5.1 surround sound. [See “Legends, camels & ACE,” InPark issue #76]

ILLUMINATIONS: human/nature and Volcano Bay *honoring indigenous cultures*

Through unique applications of technology, projects honor indigenous peoples.

As part of Canada’s 150th anniversary, Banff Center for Arts and Creativity, in conjunction with Canadian artist Sarah Fuller and Montreal-based Moment Factory, developed ILLUMINATIONS: human/nature. The event took place on historic indigenous land

in Canada’s oldest national park, Banff, in Alberta, and its newest, Rouge National Urban Park, near Toronto, Ontario. Researchers for the project interviewed First Nation tribe members, leading to storylines based upon ancient tales. During the limited run of this experience, participants in small groups carried lanterns, projectors, and other tools into the wilderness, looking for clues as they pieced together a story telling the relationship between humans and nature. The experience ended at a campfire where multimedia images came to life.

Universal’s Volcano Bay is not themed to any single indigenous people, but pays homage to the various Polynesian groups found throughout the South Pacific. The park is designed around a series of backstories. The first is the legend of Krakatau, named for the Indonesian volcano. In Volcano Bay lore, Krakatau is a god who banishes his daughter to the heavens, where she becomes the moon. In grief, he created a volcano and trapped his anger, which he called Vol, inside. This volcano lies at the center of Volcano Bay. For its other backstory, Universal Creative developed the story of the WatURI people, who traveled the world meeting with many cultures, searching for a sacred fish called the Kunuku. They eventually settled into a new home at Volcano Bay. Because of the WatURI’s travels throughout the Pacific, buildings throughout the park are designed with authentic architectural elements from throughout the Pacific Rim. [See also “An eruption of accolades: Universal’s Volcano Bay honored with a TEA Thea Award,” InPark issue #77]

MORI Building DIGITAL ART MUSEUM and Universal Spectacle Night Parade *storytelling beyond projection mapping*

For two Japanese projects, projection mapping is only the beginning.

Takashi Kudo, Communications Director of teamLab, described the MORI Building DIGITAL ART MUSEUM near Tokyo

this way: “I don’t know how to describe it.” While projection mapping has become commonplace around the world, and full-room digital art installations have been awarded Thea Awards in the past (such as Les Carrières de Lumières), MORI Building DIGITAL ART MUSEUM is something more. Housed within a 100,000 square foot space, with five unique zones, animations can be interacted with, move freely from space to space, interact with other animations, and even fuse together. The arbitrary nature of the animations sometimes results in unforeseen circumstances. In the Flower Room, flowers bloom and die as people move through the space. According to Kudo, “We had so many people when we opened, they killed all the flowers. People were walking around the room wondering why nothing was there.”

At Universal Studios Japan in Osaka, the Universal Spectacle Night Parade utilizes 54 projectors on a variety of building surfaces, with different projections for each unit of the parade, creating a three dimensional atmosphere that extends beyond the floats. The projection mapping, however, is a tool to help create ambiance and tell the parade’s story. Separated into four units, each themed to a different film franchise – Harry Potter, Minions, Jurassic Park, and Transformers – the parade features 15 floats, 100 performers, and 107 support staff per show. Like many of the projects showcased this year, the parade has an element of variability, as no two locations on the parade route offer the same experience, a catalyst for return visitation. According to Mike Davis, Senior Vice President-International

Entertainment at Universal Parks and Resorts, “I’m very proud of the fact that we used theatrical lighting for this parade. It makes a huge difference. I especially love the moonlight effect in the Harry Potter scene.” • • •

Thea by the numbers

This year saw new trends in storytelling and demographics among the 15 recipients of TEA Thea Awards for Outstanding Achievement.

- Four used IP based on motion pictures or brands
- Two were based on actual historic individuals and events
- Three were based on local and indigenous myths and tales
- Three utilized original IP for creating the storyline and experience
- Seven cater to the Asian audience – three in Japan and four in China
- Of the projects located in Asia, four were designed exclusively by local teams in those nations

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The Joker fires “laughing gas” at riders on JUSTICE LEAGUE: Battle for Metropolis. Photo courtesy of Six Flags.

Lighting Jokers

Illuminating JUSTICE LEAGUE: Battle for Metropolis at Six Flags parks

by Judith Rubin and Mark Eades

Between 2015-2017, the interactive dark ride JUSTICE LEAGUE™: Battle for Metropolis opened in seven Six Flags locations: Arlington, TX; St. Louis, MO; Gurnee, IL; Jackson, NJ; Mexico City; Atlanta, GA; and Santa Clarita, CA (Six Flags Magic Mountain, in the greater Los Angeles area). In April 2019, the ride was honored with a TEA Thea Award for Outstanding Achievement that singled out the installation at Six Flags Magic Mountain.

“We wanted it to look as real as possible for a comic book world,” said Scott Sterner, Corporate Director Entertainment and Events, Six Flags Entertainment. That “look” was a new one Warner Bros. (which owns the rights in the US) and DC Comics rolled out for the characters and world of Justice League at the same time the ride was developed for Six Flags in the North American market.

To address the challenges of authentically delivering the Justice League IP in a great guest experience on a theme park dark ride platform, Six Flags collaborated with an external creative team led by Sally Corporation and headed by Sally creative director

Rich Hill. This design, engineering and production team worked to uphold the brand while coordinating with interactive elements, 3D video, animatronic characters, set pieces and ride vehicles - to tell the story and maintain a seamless, immersive quality within the built-and-projected environment.

Leading the lighting design team for the attraction was Tony Hansen, head lighting designer and project/product specialist at Techni-Lux, an Orlando-based specialist that has provided service and equipment to numerous theme park projects and visitor attractions. Techni-Lux has been on Sally Corp’s team for all seven iterations of JUSTICE LEAGUE: Battle for Metropolis. There were lessons learned along the way, and each installation had its unique aspects, but Techni-Lux maintained a consistent approach to design and choice of equipment. The lighting installation packages specified by Hansen rely primarily on the ultra-compact LED fixtures manufactured by Los Angeles-based Gantom Lighting & Controls.

The seventh installation, at Six Flags Magic Mountain, was the largest and highest-profile, featuring the addition of the



Tony Hansen (left), lighting designer from Techni-Lux, stands with his wife Lisa Hansen, who serves as Techni-Lux's field supervisor, during install of Six Flags Magic Mountain's JUSTICE LEAGUE: Battle for Metropolis. Photo courtesy of Techni-Lux.

character of Harley Quinn. The location was a challenge for the team to top itself. As Sterner noted, "We're right up the road from Disneyland, Knott's Berry Farm and Universal Studios Hollywood."

This approach to theatrical lighting within a visitor attraction is one component of an overall approach to creating competitive attractions on smaller budgets, within reach of regional operators. The trend, facilitated by strides in technology, empowers high levels of creativity within limited budgets and shows what an enterprising, external team can do to raise the bar for quality and guest experience no matter the location.

Philip Hernandez, CEO of Gantom was interviewed for this story, as were Tony Hansen and Alex Gonzalez (vice president) of Techni-Lux.

Meeting unique lighting challenges with LEDs

While striving to authentically evoke the DC Universe and help immerse guests into the attraction environments and story, the lighting team was also charged to strive for high quality and ease of maintenance, and to use LEDs throughout.

Guests pass through several pre-show spaces on their way to board vehicles equipped with shooters that are part of an interactive gaming system. They are plunged into a series of confrontations as they travel through the dystopian Metropolis cityscape. The vehicles and interactive elements were provided, respectively, by Oceaneering and Alterface, two key team members on all installations. It was part of Hansen's lighting design challenge to make scene authentic and evocative, and lit in such a way that guests feel continuity throughout the adventure whether interacting with something built or something projected.

In one busy street scene, for instance, guests face a panorama of characters and activity generated via video gaming engine. The

bad guys are abducting some of the good guys and guests are called on to help shoot at the villains, who react in real time to being fired upon. The interactive gaming elements presented a unique lighting challenge. "Thanks to Alterface, we learned so much about the IR (infrared) of LED lights," said Hansen. "LEDs have a unique IR signature that can trigger things in the gaming system. The gaming system provider and lighting system provider have to work hand in hand for scenes that use both."

In another key scene, the guests' vehicles have found their way into the Joker's lair for a close-up, gas-laced confrontation under flickering lights; there, the characters, props and set pieces are physical characters and props. (The animatronic Joker in this scene, in signature greens and purples, has been an icon of the experience since the figure was first unveiled about five years ago on the IAAPA Orlando show floor).

Specializing in fixtures for low-light and space-constrained environments, all Gantom's fixtures are small, LED based, IP65 rated, UL Listed, and low voltage. They range from 1-Watt, single-color LED fixtures to 7-Watt, 7-color DMX fixtures. Their average fixture life is listed at 50,000 hours. Philip Hernandez talked about quality and quality control. "LEDs are made in batches and graded like diamonds with a rating system called binning. Gantom chooses LEDs from the same bin for every fixture type. That way, the color is of an even quality and degrades at the same half-life," he said. "A big benefit of colored LEDs is that designers don't have to use gels, which fade over time, and the tasks of replacement and matching colors are simplified."

Fixtures having the capability to interface with DMX dimmer controllers allow lighting designers to precisely set the level and colors for each fixture. The DMX interface also facilitates immersion and interactivity in being able to readily program the lights to change as visitors go through a room. In an IP-based attraction, this goes straight to brand consistency. The world of the experience needs to be authentic to the source material, to satisfy the fan base as well as the standards called out in the licensing contracts Six Flags holds from DC Comics and Warner Bros.

Hansen found the Gantom fixtures ideal for helping achieve a consistent look and feel in this multimedia setting. "Everything was built with lighting in mind, especially the queue," he said. "We worked with Sally's designers Rich Hill and Bill Kivi, with the scenic fabricators and with other team members to help lay out all the queue line elements and placement, crawl spaces, and handpoints to figure out where to put lights, which were all

hidden like architectural elements, mounted to pieces of wood. We would drill a hole, mount wood behind the hole, and attach the light to the wood to shine through the hole, like a recessed fixture. Now repeat that 300 times and multiply by three! (The Magic Mountain build overlapped with those in Georgia and New Jersey, requiring precise planning and quite a bit of travel.)

Setting the stage

According to Hansen, the lighting installation for Magic Mountain took approximately 500 labor hours, with nearly 90 percent of the ride lit by Gantom products – more than 300 fixtures within the queue and preshow spaces. The lights had to comply with California's stringent building and safety codes, and are UL listed. "The LEDs that are part of Gantom's Precision Z series are the ones I made the most use of. That line is available in a variety of colors and I can pick the ones I want, then mix the lights together to get any color," said Hansen.

Each room/scene has a specific mood, supporting the progression of the story, in which things take an unexpected turn and guests are enlisted to help Justice League good guys (Cyborg, Superman, Batman, etc.) battle evil super-villains (Joker, Lex Luthor, etc., plus - in the Magic Mountain installation only - Harley Quinn). "The ride at Magic Mountain has an elaborate queue line, with three very distinct feels in three distinct rooms," said Hansen.

The lighting helps create a gradual mood change as guests pass from one room to another, transitioning from the comforting, warm white light of the lobby ("except for the statues which are cool white so they really pop") to the ominous, darker laboratory ("a big bold space, with columns and uplighting") The sense that something is about to go wrong is reinforced as the environment darkens with blues and a hint of red ("the angry colors"). By the time they arrive at dispatch to board vehicles and help save the city, the ridescape is stark and angular ("we broke it up with the use of gobos, and dark, forbidding colors").



Gantom's DMX Spot fixture, shown next to a quarter for size reference.
Photo courtesy of Gantom.



Tony Hansen of Techni-Lux talks with ride director Rich Hill from Sally Corporation about where to put the LED lights made by Gantom Lighting & Controls in a scene inside Six Flags Magic Mountain's ride JUSTICE LEAGUE: Battle for Metropolis.
Photo courtesy of Techni-Lux.

Per Hansen, some major benefits of Gantom fixtures are being easy to conceal, DMX programmable, low voltage, long-lived and powerful despite their small size. "The Gantom products are so small that I can place them in plain view without the riders noticing them," Hansen said. "They're about the size of a dime or a C-cell battery, yet they are powerful enough to light objects up to 25 feet away. They draw 12 volts DC, and we run them off transformers, connected to a standard 110 outlet. In most scenes, we were able to place the wiring in cable trays or in ceilings – making it easy to hide the wires."

In addition to the main complement of Gantom lights, Techni-Lux used items from several other manufacturers for special touches, including several of its own proprietary, DMX controlled LED fixtures including "power rods" – a custom wand inside a tube, and "blinky boxes" – blinking arrays that create a sense of warning and urgency. Another Hansen signature is what he calls "liquid dimming" – the use of black spray paint to add a gritty mood and tint to the lights.

"Lighting Harley Quinn at Magic Mountain was its own special challenge," said Hansen. "She is perched above us in a spot where it was difficult to get good lighting positions while keeping the lights well hidden. In these guest access areas, everything has to be hidden, bulletproof, solid," said Hansen in another nod to the compact power and versatility of the Gantom fixtures. "The lights are hidden all around, literally in the woodwork. Harley is very green, but Joker's weapon is also green, so they had to be



Riders come face to face with Harley Quinn of the DC Comics Universe in Six Flags Magic Mountain's JUSTICE LEAGUE: Battle for Metropolis. Photo courtesy of Six Flags.

two different greens. I tried to give her character a regal, royal look, and the weapon to be sillier.”

LEDs and themed entertainment

The first JUSTICE LEAGUE: Battle for Metropolis attraction in 2015 was Hansen’s first time lighting a theme park attraction with all LEDs, a goal he had cherished for some time. Today, he’s lit all seven this way, and other projects besides. “We’re doing LED stuff everywhere,” he said, citing new projects with Sally – the recently opened Sesame Street dark ride in Port Aventura (Spain) and soon-to-open Reese’s Cupfusion at HersheyPark, both also using Gantom products. Other projects include lighting a Batman-themed waterslide collaboration with WhiteWater West (honored with a European Star Award) and a snow-tubing hill at a ski resort. “Some of what we’ve managed to dabble in is phenomenally unique,” said Hansen.

“Our company has deep technical understanding that allows us to be very flexible for the client and make the technology much easier for them to deal with,” said Alex Gonzalez. “We function as a design and support team, a theme park tech think tank. We have been doing this for 25 years in theme parks and 37 years overall design, and have great connections and resources. We bring knowledge and experience to the table.”

JUSTICE LEAGUE: Battle for Metropolis was our focus for this story, but the lighting trend it represents can be found around the world in numerous attractions. Permanent installations, such as another recent Thea Award recipient, the Basilisk dark ride at Legendia Park in Poland, can transform a park and bring new

tourism to the region it serves. Popup attractions are also embracing the trend: Smallfoot Yeti Village, for instance, was a two-story, animated walkthrough that helped Warner Bros. build buzz for the “Smallfoot” movie premiere in summer 2018.

“As themed entertainment expands and its tools are applied to more market sectors and venues, people realize the value of it in their facility,” said Hernandez. “You can see the expansion in museums and restaurants and casinos moving in that direction, for example. The designers who do those projects tend to have roots in theater and/or themed entertainment.”

“It’s an exciting time for lighting designers and the attractions industry in general. There are so many great tools and technologies to play with, and so many types of projects and challenges,” said Hansen. “We congratulate Six Flags on the success of the Justice League attractions, and look forward to the next adventure.”

Genesis and acclaim

Prior to JUSTICE LEAGUE: Battle for Metropolis, there was Justice League: Alien Invasion 3D, which opened at Warner Bros. Movie World in Australia, in September 2012. Sally Corp. led development of the ride, and following its success, Sally CEO John Wood sought to bring the concept to more parks around the world.

Six Flags was a good fit as the regional chain had licensed the theme park rights to the DC Comics Universe in the US, with many thrill rides themed to DC Comics characters – and JUSTICE LEAGUE: Battle for Metropolis was born. The combination of real-time, 3D video gaming within a highly detailed immersive dark ride setting marked a new and successful direction for Six Flags.

In addition to attracting the patronage of theme park audiences, with the new Justice League attraction Six Flags has earned new acclaim and respect from within the industry. It was the Magic Mountain installation that earned the Thea Award, but in its official comments the TEA Thea Awards Committee took note of the development arc: “...with the JUSTICE LEAGUE™ attraction in seven parks since 2015, Six Flags and their team have achieved a commendable, constant trend of artistic and technical improvements and set an example for the industry.” • • •

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All eyes on Lanzhou

ECA2 prepares to unveil its newest spectacular in China, in summer 2019

interviews by Martin Palicki

ECA2 is a design and production firm known for unique, large-scale, theatrical multimedia spectacles: permanent installations and one-off special events, often in outdoor and waterfront settings. The permanent shows have helped to bring in tourism and develop areas into destinations. Their latest spectacle, a permanent installation in a custom open-air theater, is currently being built in Lanzhou, in the Gansu province of northwest China. InPark spoke with Jean-Christophe Canizares (chairman & CEO), Chengcheng Chi (chief architect & stage designer on this project), Olivier Ferracci (artistic director) and Julien Causeret (international sales & marketing executive).

Who is your client for this new show in Lanzhou?

Julien Causeret: We are working with Gansu Xirong Cultural Tourism Development Co., Ltd. to create a new spectacular. They are a public agency of cultural and tourism promotion.

How did they find ECA2?

Julien: The client was familiar with ECA2 because of our 30+ year track record of working in China. They had seen a number of our multimedia shows. Most recently, they saw “Eastern

Sunrise” in Rizhao, Shandong province when it opened during the summer of 2016, after which they contacted ECA2 and began discussions on how to bring our expertise to Lanzhou.

What was your client’s direction for this show?

Jean-Christophe Canizares: Lanzhou is a key hub on the Silk Road, a place where many different civilizations stopped in the course of their journey through. It is located in the north of China, not far from the Gobi Desert, in Gansu province. The client wanted to develop a show that was, naturally, locally



A design sketch for ECA2's new show, currently under construction in Lanzhou, China. All photos courtesy of ECA2



Jean-Christophe Canizares



Chengcheng Chi



Olivier Ferracci



Julien Causeret

oriented but with universal meaning. Since they were familiar with our work in China and elsewhere in Asia, they were aware that our team can develop a full experience around Chinese stories and traditions thanks to our international vision and language.

Tell us about the physical setting for the show.

Jean-Christophe: Regarding the show environment and design, first we had to study the climate and weather conditions. Lanzhou has quite significant temperature fluctuations throughout the year, with very cold winters and very hot summers. Since the client had only seen our outdoor shows they wanted us to develop the same kind of experience but in a more protected environment. Even though a fully indoor experience could have also worked, our collaboration with the client resulted in a semi-indoor, semi-outdoor approach which pleased them a lot!

What is the iconic element of this show?

Chengcheng Chi: The theater itself! The architecture, the building's shape and the scenography are definitely what makes this project iconic.

Our idea was to create a dome that would have an open sky in the center to meet this semi-indoor, semi-outdoor requirement. On one side the audience area is covered, on the other side the main show sets (and focus of the multimedia performance) are covered. The space in the center creates this semi-open-air theater, but there is an additional hole strategically placed over the stage that allows us create a prime location for water, lighting and laser effects, along with what will be the largest permanent cascade screen® that we've entirely manufactured.

Tell us about the show's storyline.

Olivier Ferracci: This show will take audiences on a fantastic journey through a cosmological narrative of China, describing the

creation of the universe by an original god named Pan-Gu. It will be divided into two major parts. The first half will focus on how Pan-Gu had to find a perfect balance between earth and sky while creating the universe. The second half will explore how Pan-Gu transformed his body at the end of his life to create some of the major elements that compose today's world: wind, clouds, thunder, sun, moon, rain, stars, mountains, rivers, plants, trees, metals, stones and rocks.

Tell us about the technology and how it will bring out the story.

Jean-Christophe: We're telling a unique story with a unique and appropriate combination of technologies, on quite a large scale. ECA2 is known for using all types of multimedia technologies: water effects, light, sound, laser, pyrotechnics, video and more! I believe this new show will host the largest 3D video mapping that we've ever done for a permanent installation (approx. 2800 square meters).

We focus on innovation by customizing existing technologies and sometimes by manufacturing new prototypes for the needs of each show.

As mentioned, we will also install a cascade screen® at the edge of the building's roof and its scale will really be remarkable. During the Yeosu International Expo in 2012 in South Korea, we introduced the world's first permanent cascade screen® with the Big-O Show that is still running today. The shape of this water screen is oval and its size is 30m x 25m. Here in Lanzhou, it will be a rectangular screen of 40m x 24m. We took inspiration from the Big-O Show in South Korea by pairing the cascade screen® with video mapping in the background. I expect it to be one of the biggest strengths of this show because we will create different layers of video on a very large stage.

It will be state-of-the-art, yet timeless.

How far along is construction?

Julien: When finished, the construction will have lasted for about a year. As of April 2019, 80% of the construction was completed. We are expecting the show to open between July and September, depending on the climate and weather conditions to finalize the last step of construction and production.

What other shows is ECA2 currently working on?

Julien: Currently we are also working on a highly immersive indoor multimedia show in China. There are also other big developments that are confidential for the time being, in the Middle East and Southeast Asia. •••



The Big-O Show in South Korea

ECA2's greatest hits

by Martin Palicki

ECA2's shows have a distinctive and recognizable feel to them. While I have only personally seen a small portion of their impressive portfolio, a few come to mind when thinking of their most memorable experiences. Here, in chronological order, are some of ECA2's greatest hits. Many have been recognized with TEA Thea Awards, by the Themed Entertainment Association.

Eiffel Tower Millennium Show (France, 2000)

Videos and photos of Paris' iconic Eiffel Tower awash in sparkling lights and fireworks circulated around the globe shortly after the end of the 20th century. While the spectacle was best experienced live, nearly everyone alive at that time will remember those images as representative of the start of the new millennium.

BraviSEAmo, Tokyo DisneySea (Japan, 2004-2010)

Directed by Yves Pépin, BraviSEAmo used Tokyo DisneySea's beautiful harbor and volcanic mountain backdrop to tell the ancient story of the Fire Spirit and Water Spirit. Naturally, both fire and water factor prominently into the show, which utilized several barges and a giant mechanical structure that arose out of the water nightly.



Songs of the Sea (2007-2014) and Wings of Time (2014-), Sentosa Island (Singapore)

Built into the harbor, the successful Songs of the Sea was re-imagined into a new show in 2014: Wings of Time. Both shows have taken advantage of ECA2's core skillset of projection, lasers, pyrotechnics and music to tell culturally relevant stories, all while battling the corrosive effects of the ocean.

The Big-O Show (South Korea, 2012)

Originally designed for the 2012 World's Fair in Yeosu, the show's iconic "O" structure served as both a rig for fountain, lighting and pyro effects, as well as a giant water screen for projected images. The show still plays regularly, even though the Expo ended years ago.

Fountain of Dreams (China, 2015)

This permanent show in Wuyishan seats audience members under a giant cantilevered roof facing a small mountain stage (in front of the very real and beautiful Wuyishan mountains) that is bathed in projection mapping, pyrotechnics, and millions of gallons of water, which cascade from nearly every corner of the theater. The audience becomes part of the show when water fountains eventually cascade *up* the stairs of the theater and surround the audience with flowing water.

Eastern Sunrise (China, 2016) [pictured]

Located in the Eastern seaside town of Rizhao, Eastern Sunrise builds on the town's ancient fable of being the first to see the rising sun each morning. A line of eight stylized sails rise out of the water. They serve as projection surfaces, but additional water screens located around the stage allow animated characters to move forward, backward and across the set with ease. New pump and fountain technologies allow for a wide array of water effects, which are punctuated by ample amounts of pyro and fireworks. •

For more information, visit eca2.com



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Secret sauce; Magic Glaze

Kraftwerk LT provides immersive theater technology and technical design to new cultural center in Hunan Province, China

News from Kraftwerk LT

Fulfilling the largest contract in its 26-year company history, Kraftwerk Living Technologies (Kraftwerk LT), a leading AV system integrator based in Wels, Austria, provided high-end AV systems and technical expertise for two custom, media-based attractions at the Tongguan Kiln Cultural and Historical Center, open since October 2018 in Hunan Province, China.

Known for its porcelain craftsmanship from the Tang Dynasty, the Center portrays the 1,200-year heritage of Changsha city in Hunan Province. It is part of Tongguan Kiln Ancient Town, a 1.1 million-square-meter complex featuring eight museums, five performing arts centers, three luxury hotels and 18 cultural attractions, expected to draw 5 million in annual tourist attendance.

Kraftwerk LT provided systems to supply two, state-of-the-art, immersive, media-based experiences: “Beautiful Hunan,” a 72-seat flying theater attraction and the 800-seat “Magic Glaze” 5D Theater. While the flying theater, for which Kraftwerk LT provided the screen and high-end AV system on behalf of CAVU Designwerks, has been open since October 2018, the first park guests entered the “Magic Glaze” theater during soft

opening at the end of March to experience the highly immersive 5D experience. Kraftwerk LT received the order in 2016 and 30 months later, both attractions were completed.

As part of the project scope, the media-based-attractions experts from Kraftwerk LT were responsible for the technical design, detailed planning, supply, integration, programming and commissioning of the “Magic Glaze” theater – including all technological components such as the 3D screen, projection and audio system, SFX motion seats, show control as well as the water and compressed air system, show lighting and special effects. The attraction allows for a maximum daily guest flow of over 20,000, peaking at three 15-minute shows per hour but also features other show control modes, to optimally operate the attraction based on need.

Guest experience

“What is special about this 5D Theater is the seamless integration of the cultural center’s main theme, porcelain craftsmanship, into the attraction. When entering the theater, you walk into the interior of a flaming oven – realized with scenic lighting, various projections and special effects. With this ‘flaming’ atmosphere,

the stage is set for a great story and entertaining experience,” explains Manfred Meier, CEO at Kraftwerk LT. The film, produced by PRANA Studios, relates the adventure of the main characters Xiaoxiao und Tongtong, who chase after the “Magic Glaze,” which they seek in order to break an evil spell that has been cast over Tonguan town and its inhabitants. Enhanced with motion and special effects, the experience was designed to entertain all ages.

For its part, the “Beautiful Hunan” flying theater, provided as a turnkey solution by CAVU Designwerks, allows guests to visit picturesque locations in the Hunan province as part of a six-minute fly-over experience. The high-resolution visuals are paired with smooth, realistic motion and in-theater special effects, supporting the feeling of flight. Once again, the media was produced by PRANA Studios and weaves together dynamic, live action flight imagery with visual effects.

The project was delivered to the Macrolink Group, a Chinese company involved in real estate development. “These two theaters are a brilliant example of how media-based attractions - a classic format in theme parks - can be customized to share the stories and messages of cultural and educational destinations,” says Meier. “We’re pleased and proud to have been part of the team.” • • •

More info: <https://www.kraftwerk.at>

Magic Glaze | Technical Highlights



- 3D projection surface: ~ 1,000 m²
- Total dome screen surface (projection + scenic): 2,214 m²
- 2D ceiling mapping surface: ~ 800 m²
- 800 SFX motion seats with precise 4DOF motion and integrated special effects ranging from wind, water and smoke to vibration, poke effects and more
- 6 x 4K Barco XDL RGB Laser Projectors
- Scenic lighting
- QSC audio system

The Magic Glaze theater at the Tonguan Kiln Cultural and Historical Center utilized 5D theater effects to take guests into the world of fine porcelain craftsmanship. All photos courtesy of Kraftwerk



Personalization prevails

Holovis supports new attraction formats that allow guests to choose their own adventures, and encourage repeat visits

by Kevin Dazey

Holovis, a leading experiential design company, is using its R&D muscle and technical savvy to help build state-of-the-art technologies and tools for the future of guest experience. That vision of the future is one of personalized attractions and experiences in seamless, immersive, responsive environments - where technology is transparent, and guests are empowered to choose their own adventures.

Personalized storytelling has been around in other genres and formats, but is relatively new to the attraction model. A genre of books aptly called “gamebooks” use a format wherein the reader determines the action. Probably the best-known of these is the children’s series popular in the 1980s and 1990s, called “Choose Your Own Adventure.” The series essentially gave readers control of the main character that led to various possible endings. In digital video, a popular interactive storytelling option is the “Black Mirror: Bandersnatch” movie on Netflix. Viewers went back and watched it over and over to try the different choices.

And that’s the ultimate goal: to design and build something people want to experience again and again. Disney did it to some extent with StarTours 2.0 and then with Nemo SeaRiders - but while providing personalization and a range of endings, those rides don’t extend to the guest having more decisive agency.

That’s the challenge Holovis is now addressing in its R&D lab in the UK: to develop tools and technology that help achieve a deeper level of personalization, agency and open-endedness within the context of attractions. Other applicable terms used today include “non-linear storytelling,” “participation culture” and “connected immersion.”

Ask Peter Cliff

Can themed experiences become like snowflakes, no two alike?

How? Peter Cliff, Holovis creative director, says, “The best experiences are story driven. That is the case whether the attraction is a rollercoaster, media and motion based simulator, walk through experience, or a projection mapped show. A great narrative drives guest engagement, stirs emotion, and creates enduring memories.”

Before joining Holovis in 2016 Peter spent several years on the operations side, working with Merlin Entertainment in various roles with a focus on live entertainment. From street performer at Alton Towers Resort, he moved on to a series of creative positions and played a major role in developing the park’s Scarefest attractions. “This experience from end user to solutions provider gives me a unique perspective and insight which I use to help parks develop their attractions and narratives, supported by the resources of the Holovis team.” This includes working with clients to help create experience centered entertainment that exercises the philosophy of giving the audience a degree of control.

Again, how?

First, “...by using real-time media which is rendered using a game engine so the story can take different directions depending on how much guests choose to engage, the decisions they make, and paths they choose to take through a story,” says Cliff. Second, “...through invisible tracking technologies that use the guest as the marker, removing the reliance on any additional devices and therefore removing the barrier to adoption.”

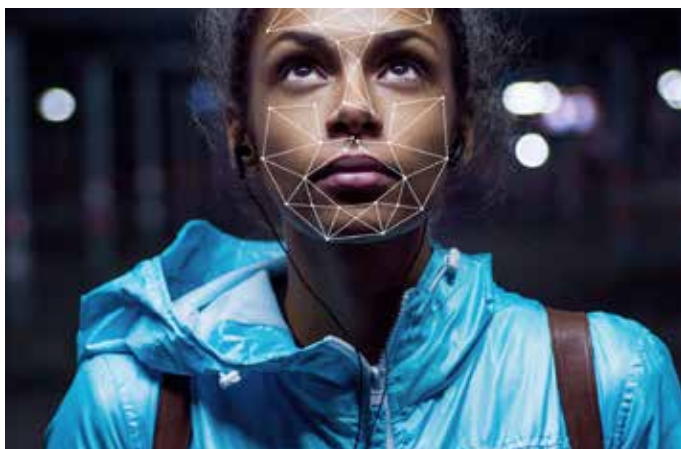
Per Cliff, the personalization element being developed will preserve group interactions (VR would not be used). Madame Tussauds’ The Justice League: A Call for Heroes (Orlando and Sydney) is an example. Holovis delivered the interactive

features for the original and additional characters unveiled at these locations. The interactives allow visitors to engage in various ways, such as racing alongside The Flash, or discovering a code that enables Cyborg to display a hologram. “Our challenge is to bring that to life using the best combinations of multisensory technologies and special effects, ensuring that the technology is invisible to the guest, facilitating an amazing experience, but without them being aware of the high-tech environment around them.”

Holovis envisions personalization of this kind transforming guest experience and guest options within many existing media-based attraction formats and theater configurations, for entertainment



Peter Cliff



Clockwise from top left: guests at Madame Tussauds grab Aquaman's trident to trigger his superpower; the Royal Liver Building; guests star in the scene alongside the virtual characters in The Battle For Kings Dominion; invisible tracking technologies give guests the power to interact with and control the world around them. *All photos courtesy Holovis.*

and/or education. Possibilities include fulldome theaters, flying theaters, story-driven roller coasters, immersive tunnels, dark rides, Augmented Reality (AR)-enhanced historical recreations and adventures, walk-through exhibitions and more.

Some recent Holovis projects form real-world examples. The company supplied a 270° projection mapping show and augmented reality app for Liverpool England's historic Royal Liver Building, contributed some Holovis magic to a new Dungeon attraction at Alton Towers, and announced a partnership with WhiteWater West. Variety and adapting to client needs are hallmarks of Holovis business culture.

Deep personalization

The ideas being explored now such as invisible tracking solutions and real-time media enable ever deeper levels of personalization and customization. "Invisible tracking technologies create unique experiences for guests by giving them the power to interact with and control the world around them," Cliff says. "This begins with facial recognition to register them in the system. The power is then put directly into the hands of the guest using gesture recognition to control the world around them, cast spells and

bring hidden narratives to life. This removes all barriers to entry because guests already have everything they need to begin playing. Object recognition can be incorporated to bring props into the experience which can drive additional revenue opportunities."

On a larger scale is the potential to create a cohesive, immersive, responsive environment providing perks to an individual based on actions or places visited. "This system can be used to connect the whole park ecosystem starting with a guest experience, but also tying into food and beverage, retail, loyalty schemes, ticketing, payment, and security," says Cliff. "For example, if a guest has just earned a high score on something, retail staff can be alerted as the person approaches the kiosk and they could be offered a free coffee as a reward. Due to facial recognition, they wouldn't need to present anything or have anything scanned."

Holovis believes that this new wave of active, participatory attractions will drive the future of experiences throughout the out-of-home entertainment space at museums, zoos and FECs in addition to theme parks, but the technology is readily available now.

“Our software team has already developed the proprietary ecosystem that will drive these experiences, but its going to take a certain type of operator with a clear vision to utilize them.” Cedar Fair took the first steps towards this vision with the Battle For Cedar Point and Kings Dominion experiences. These unlock hidden narratives throughout the park and give the guests multivariant experiences each time they visit, driven through a mobile phone app.

“The next step would be to remove the need for the phone and have guests interacting directly with the park, not through a second screen.” The variables and power of the system mean that

guests could discover new surprises and new elements on each visit. Per Cliff, media can be altered quickly once the systems are established, supporting repeatability. “The modules that we are creating can be used as park wide entertainment to bring queues, rides, or certain zones to life through magical interactions.” • • •



Kevin Dazey has a mechanical engineering background and works in R&D at a manufacturing company in St. Louis. He writes about ride engineering, roller coasters and related topics for InPark. dazey200x@yahoo.com

Keeping on top of trends, at Holovis

Coasters with content

Storytelling and media have not traditionally been combined with high thrill roller coasters or those with extremely dynamic and high G-force action. Those coasters that do have such features have existed mainly on the mild spectrum when considering the thrill factor. Holovis sees opportunity.

“Roller coasters have certainly undergone an evolution in the last few years,” says Cliff. “As records have been broken relating to the fastest, tallest, and steepest, physically the human body has been pushed to the limits on these experiences. We now need to look for alternative ways to differentiate.” Indeed, the last few years saw debuts of story-driven, roller coaster experiences including thrill moments and media content, with Holovis on the project team. The format has continued to spread and 2019 continues the trend. [See “Alton Towers: Wicker Man,” InPark issue #74]

In keeping with this trend, Holovis collaborates with S&S – Sansai Technologies, manufacturer of tower rides and assorted roller coaster types. From this has come the “MediaCoaster” concept that includes a pre-show, 360° media dome, elevator lift, and story from start to finish. “These are thrilling coaster experiences, but the track is immersed into media moments by going into projection domes, with immersive tunnels on launch hills and slowing to allow guests to interact with media scenes,” Cliff says. “The system includes Holovis gesture tracking and facial recognition technologies to identify the individual and create an outcome personalized to them, based on the other experiences they have had around the park.”

Key here is the physical aspect of a roller coaster merging with fully developed stories and/or individually customized content. Cliff says, “With our invisible tracking technology we can take queuing and preshow

experiences to the next level and even continue the interactivity and effects whilst on the ride, personalizing the experience using real-time media for each guest.” He reports that MediaCoaster projects for clients in China are currently underway.

Fresh flying theaters

The number of flying theaters continues to grow and the format remains hugely popular. This large screen cinema experience found in theme parks and standalone attractions typically offers motion seats that allow guests’ feet to dangle to heighten the sensation of flying through the world of the media landscape. This riding position has been the standard. Holovis decided to switch things up with a version of its own that places passengers in the prone position. “We felt that the traditional flying theater wasn’t truly giving people the experience of flying, because they are sitting down, which instantly breaks the illusion,” says Cliff. “Flying should be experienced from the prone position, so that is exactly how we have re-evolved the experience with Li-Fly.”

The company decided to create two versions, each with its own distinctive motion profile. Li-Fly permits surge, heave, and pitch (a full 360° rotation head over heels) while suspended in a dome theater configuration. The alternate model, Li-Fly Hex, allows 6-DOF; pitch, roll, yaw, heave, sway, and surge. Li-Fly permits individualized flight intensity as well, Cliff would add. “With Li-Fly Hex, our free-standing experience designed for smaller spaces such as FECs, we can even separate the pods so that each guest can control their own motion profile, taking it steady if they just wish to glide through, or for extreme thrill seekers, rotating and dropping as many times as they like. Because this will be taking place in a VR environment, the media will react to the motion profile to bring each guest’s variation of the world to life.” •



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An industry of partnership and collaboration

by Jeff Havlik (vice president), Carol Breeze (exhibit designer) and Steve Mohesky (visualization designer) of PGAV Destinations

The limitless potential of partnerships crosses oceans, crosses borders, and ferries us all – together – into the future of themed entertainment. Without this collaboration, we only grow more distant and fractured. In the attractions industry, the best practices we now enjoy in terms of partnerships and amicable collaborations took time to evolve. It took decades of learning, growth, and proven success for cross-skillsset, cross-institution, and even cross-country teamwork to become a key ingredient in today's themed entertainment innovation.

In the early 1990s, PGAV was endeavoring into its first international foray: developing Port Aventura from the ground-up, in Salou, Spain. The experience set a precedent for decades to come – experimentation with new technologies, in depth market research, how to meet new and lifelong partners, and the thrill of shared learning with a team possessing a completely different worldview.

Partnering Abroad

On the macro-scale, the growth of ground-up destinations in the United States has slowed in recent decades, focusing more on expansions and enhancements. However, across the globe we find the fast-paced development of numerous larger destinations arising from mountain foothills, seaside vistas, or what was once farmland. For many design firms that aren't licensed to practice architecture in many of these economic take-off countries, partnerships are an absolute necessity. To be successful on the international stage requires several different partnerships:

Client: The client is certainly the central partnership, offering irreplaceable insights into the needs for their particular site.

Local Architects: These teams understand governmental policies, regional code requirements, and the varying means and methods of construction in the country.

Sub-Consultants: Just as with the local architects, these teams have specific knowledge of their culture's approach to development and construction.

Suppliers: These resident teams have the ability and know-how to navigate supply chain and logistics to provide the equipment, rides, and more that relate to the international destinations.

Partnering abroad is a unique, thrilling experience. Throughout the United States, although there are certainly varying company cultures and management styles, our attractions industry has relatively set ways in operating destinations, developing projects, and managing teams. Once the passport has been repocketed though, it's an exciting time to learn brand new ways of doing business. It's a two-way flow of information: showcasing best practices from America that international clients may have never considered, and learning the successful practices from abroad – and oftentimes the even more fascinating, brilliantly complex, or culturally straight-forward rationale behind those practices. These insights have, without exaggeration, changed our entire perspective on projects and destination development.

Finding Friends Afar

These partnerships don't magically happen. Although an internet search can be a starting point, the strongest partnerships form from meeting individuals one-on-one. One of the ideal settings to meet these future partners has been at international

symposiums and conferences from the myriad IAAPA & TEA events, global zoo and aquarium events, and more unique events such as the recent Connected Audience conference in Berlin. But simply showing up and networking these events is not enough. Serving on committees, attending symposiums, and participating in forums and workshops leads to personal connections with owners, operators, and yes – competitors, that often turn into partnerships. Additionally, PGAV presents in sessions as often as possible. It's an opportunity to share our lessons with the global community and broadcast our values and interests, which leads to meeting like-minded people to form long-lasting partnerships.

It's obvious we find these industry events important to forming partnerships. Our designers believe it's essential that institutions invest in these conferences, if they are able. Beyond our own attendance, it's important to find opportunities to financially support expos with sponsorship, which often bolster internal as well as industry-wide strategies. Stakeholder companies (e.g. all of us) must ensure that these events, especially new and growing events in emerging markets, are successful and long-lasting. The relationships they spawn strengthen the international attractions design community, and therefore the global entertainment industry.

Our partnership with the global entertainment industry extends beyond the participation and support of industry organizations. For over 15 years, we've published our quarterly *Destinology*



Events like the IAAPA Leadership Conference at IMG Worlds of Adventure, give professionals an opportunity to build industry relationships. *Photo courtesy IAAPA.*
OPPOSITE: PGAV has helped develop Port Aventura since its creation in the early 90s. *Photo courtesy PGAV.*

and annual research projects containing essential insights into attraction guest behavior and destination best practices. Destinology, Voice of the Visitor, Inspiration from Nature, and even the brand new Welcome! Profile of International Guests to America are the result of partnerships with clients, operators, and researchers. We bring the greatest wisdom and lessons from our partners and distill them into these reports, initiate primary research to discover guests' patterns, demographics, motivations, behaviors, and trends, and freely distribute these to the global entertainment industry.

Go Forth and Learn

Building strong international partnerships and successful projects takes empathy through an understanding of the culture that goes beyond the meeting room. Five years ago, we introduced "PGAV GO!," a self-directed professional development program where staff are allotted an annual fund to invest in themselves however they choose. Although the opportunities are broad, more than 80% of the funds are expended on traveling the world. This empowers our staff to be guests, tourists, and researchers, which brings unique and ever-advancing insights into the world's cultures through personal experiences and insights as a guest. This quest for experience pays limitless dividends for our partnerships and project work. Cultural familiarity extends beyond the project executive that travels to the site, to each person on the team solidifying partnerships through empathy.

How to be Together in Technology

Pop culture science fiction technological promises are starting to show up in our lives. Virtual Reality, Augmented Reality, and Artificial Intelligence influence the expectation of attraction guests, destination managers, and themed entertainment designers. We're thrilled by the prospect of these tools and their possibilities to blend story worlds, allow us to design in real time, and connect our teams with other experts around the world through a virtual environment, but the reality doesn't quite yet meet the virtual reality. It solves some problems, yet creates new ones. It is through our partnerships that we work toward empowering the technology to bring us together.

Our internal Innovation Group scans the horizon beyond the themed entertainment industry, scrapes the internet and Twitter for new products and evolutions, and passionately debates innovation and technology. The team meets with software developers from around the world, discussing the challenges they see coming in the future, and collaborating to imagine what software could solve those challenges when they arrive.

New technological discoveries are often a grassroots effort, essential to a culture of innovation: an individual uncovers an opportunity that thrills them, and they bring it to the Innovation Group. The team evaluates whether these new programs can work seamlessly with other programs throughout the design process, and whether they apply to design and modeling, rendering, animation, and/or the tools used to share design concepts. It's rarely a goal to replace tools – designers will always use ink and clay – but it's about enhancing the existing toolbelt.

The most exciting way to explore a new technology is to find a client who's comfortable and excited to have it tested on their own project. Never use new technology just for the sake of using it: use the right tool for the right job. Sometimes this comfort level is reflective of the resources a park has available to it, while sometimes it's ingrained in a country's culture – accustomed to, or almost expecting, 3D immersion and gaming capabilities. The process of design with the client is an exciting frontier regarding AR/VR technologies. PGAV's new Highly Immersive Virtual Environment (HIVE) is a dedicated catalyst lab for our designers to explore new technologies, as they meet with clients to explore projects in an immersive opportunity. That frontier is aimed at developing even more ways to digitally collaborate with our clients in real time, whether we're across time zones, all at a digital table adjusting a beautiful rendering, or standing in a virtual environment, adjusting lighting, color, and environments immediately with the adept flourish of a tilt-brush.

Beyond design, AR and VR are on track to merge together and create new and intriguing guest experiences. In our Destinology research, a key motivator for attraction visitation is always, "to have fun together." The technological challenge is that often VR is an isolating experience: we put on our headset, and we no longer see the looks of surprise and joy on our children's faces. Haptic vests, interactive spaces, or digital devices that provide further information on exhibits and animals are all evolving in a similar direction, bound to merge eventually – and our collaborative R&D is essential to bring us all there together.

Evolving from Tradition to Together

These incredible global partnerships have mandated that a traditional destination design firm must evolve and broaden its abilities. It must become a foundational business consultant, analyzing the business and existing products from the very beginning, to develop strategies that may have no relation to attraction design. It must be an adept market research firm, near-obsessed with psychology, social behavior, pop culture, empathy, and guest insights. It must be a cutting-edge R&D lab, ever horizon-scanning, experimenting, fearless in risk-taking, and reliant on trial and error. It must expand its services beyond the traditional up-front concepting, delving into construction documents, the disciplines within lead design consultancy, tendering the project, reviewing bids, construction administration, leading art direction – even living on site for years to make that all happen. But this all must be done together, in a collaborative partnership.

Because we are all better together. • • •



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Design, Engineering, Consulting, & Technical Direction
for Theme Parks, Museums and Attractions.

AUDIO

VIDEO

SHOW
CONTROL

The era of the timeline

(aka “That’s Show Control!”)

by Scott Harkless

One weekend not long ago, I took my 5-year-old son to a local air show. I can never resist an opportunity to blow his mind with something he’s never seen before, and the debut performance of an F-35A Lightning II slicing through the sky right over our heads struck me as a good opportunity. Let’s just say that he wasn’t disappointed! Still, the thing that always captivates my attention the most at these air shows are the formation flying teams. The skill and coordination required to perform advanced maneuvers within a few feet of other airplanes at speeds pushing the edge of Mach 1 is just mind boggling to me. I’ve seen the documentaries that talk about how much these pilots practice, how they rally behind the team leader, and how they coordinate maneuvers by using their own lingo to communicate their every move in cadence with the show, but it’s still impressive to see in action. Without their precise coordination, the team would not offer a thrilling performance for the fans below or return to the flight line safely for that matter.

Come to think of it, designing theme park rides is almost exactly the same, right? Ok, so maybe we don’t have afterburners, flight suits, aviator sunglasses, or the threat of constant peril but, in all seriousness, we actually do share at least one common challenge. We share the same need to coordinate multiple systems with extreme precision in order to safely put on an amazing show for our guests. Instead of hot shot pilots, the team members of our ride-based attractions are sub-systems like projection, on-board audio, ride control, special effects, figure animation, and lighting. Under the command of their fearless leader - the show control system - these sub-systems all need to coordinate perfectly with one another to put on hundreds of performances a day, seven days a week, 365 days a year, for 10+ years with no time to stop and sign autographs.

The scene trigger and the game change

We’ve devised some nice solutions to this problem in the past. For example, one of the easiest ways to achieve a respectable level of synchronization has been to slice up the ride into sections we refer to as “scenes.” Sensors would be installed along the ride path to detect whenever a vehicle enters a scene. The exact method in which this is done varies, but the end result is typically the same; both the vehicle’s on-board show system and the wayside show control system receive a momentary trigger when the vehicle trips the sensor. Each system reacts as quickly as possible to this trigger to play their portion of the show experience for the current scene. In other words, this shared trigger is the only thing responsible for synchronizing the onboard and wayside show systems at the beginning of each

scene. Once they start running their individual portion of the scene experience, they both free-run individually until the vehicle enters the next scene.

This method has served its purpose well for some time, but now, the game is quickly changing on us.

We all know that the industry is growing at an incredible pace right now. The big players are competing intensely with one another in a global marketplace. This is leading to the development of many new attractions, each with more complex design requirements than ever before. Staying ahead of the curve means re-thinking how we design sub-systems – so that they can offer more flexible control and also be more easily distributed between multiple vendors to make the workload more manageable. All this must be accomplished without sacrificing the precise synchronization that’s critical to the guest experience. The new trends born of competition are forcing us to re-conceive the way we coordinate our systems so that we can meet the demands of new attractions.

One circumstance that exposes the limitations of the scene trigger is the need to stop and then resume the ride vehicle’s journey, along with the show experience, in the middle of a ride. Why, you ask? It’s often for safety reasons. Some of the most popular attractions in the world are “Omnimover” style ride systems with moving load platforms. Anytime you have a moving load platform, there’s always potential for the entire ride to be stopped for a number of reasons. Perhaps a guest isn’t properly fastened into their vehicle or requires additional time or assistance to be seated properly. Though it would be powerful motivation for everyone to load up quickly, the operators don’t really have the option of letting guests leave the load platform unless they are properly secured to their ride vehicles.

The problem with stopping an omnimover ride system is that if you stop one vehicle, you stop them all. Although John and Jane Doe boarded their vehicle just fine, something can happen 25 vehicles behind them that forces operators to take action to stop the entire ride. John and Jane’s experience becomes that of being halfway through a ride scene, sitting in a motionless vehicle with no show experience. Although the ride starts back up promptly, they have another 30 seconds to go before they encounter the next scene trigger. That’s 30 seconds of dead air that they may well post to social media for all of their friends to see. Once they step off the vehicle, they will demand another ride in compensation for their interrupted experience, adding further to the overall wait time for guests in the queue.



An example of an Omnimover system at Hong Kong Disneyland.
Photo by Lotues Wosheang, Wikimedia Commons

Show control: the fearless team leader

Another trend is an increasing number of sub-systems within a single project, each with its own vendors responsible for integrating and programming them. All of these individual show or scene timelines need something to coordinate them, to precisely trigger them along with all of the other vendor systems. In other words, we need a fearless team leader to call the shots using lingo that all of the team members can understand. We need the show control system.

The first important component of this coordination is to get everyone/everything on the same page or, to be more precise, the same time reference. Utilizing the right show equipment in conjunction with industry-standard clock distribution methods such as PTP, NTP, GPS, and SMPTE timecode, we can ensure that all sub-systems know exactly what time it is with microsecond-level precision. This is critical because it isn't enough for the show control system to just tell the sub-systems to "GO!" Factors such as wireless network latency would pretty much guarantee that everyone receives their triggers at different times and that's not precise coordination. Instead, we need to empower our show control system with the ability to give everyone a little advance notice and issue a more specific command like "EVERYBODY GO AT EXACTLY 01:02:03.456." The command packets bounce through the network, soar through the air, and arrive at each sub-system in their own due time. Each sub-system then waits for their precisely synchronized clock to match the scheduled time, and away they go!

The second critical part of this coordination is making sure that all systems share a common understanding of what exactly they're supposed to do when they receive these "GO" commands. Since we're often dealing with timed series of events or media playback, show control timelines offer the cleanest

solution that everyone can understand. If you're not familiar with the concept, imagine that you're using audio or video editing software. In this editor, you can view your 30-second clip in a horizontal, timed-based layout. You can play, stop, pause, loop, or even skip around the clip as you please. Show control timelines work in the exact same way except that, in addition to audio and video, they can also control lighting fixtures, animated figure positions, and many other types of entertainment systems. Using this common platform, you can have as many sub-systems as you wish as long as they each have their own timelines that are designed to synchronize with one another. Just like the lead pilot at the air show, the show control system can dispatch commands to all of them to coordinate a perfectly synchronous start – so they can all fly in formation, so to speak.

The era of the timeline

As for the control flexibility required to solve our omnimover debacle, keep in mind that these new synchronization methods no longer depend on momentary scene triggers. Instead, the show control system can interface to the ride system at a much more intimate level to gather information, such as a ride vehicle's exact position along the track. When it comes time to start the ride back up, the show control system simply reads the vehicle's current position and then dispatches commands to start all of the necessary show control timelines at the appropriate position. If the vehicle is halfway through the ride, no problem. We just skip to the middle of the timelines so that the show experience picks back up right where it left off. For example, let's say our friends John and Jane are 1:30 into the ride when the ride is stopped. When the ride starts back up again, the show control system will command the on-board audio system of their vehicle to skip ahead to 1:30 within its show control timeline. It would also do the same for all projection, motion control, and lighting sub-systems that are surrounding their vehicle. In a fraction of a second, all show elements resume seamlessly from 1:30, John and Jane enjoy the rest of their ride, share their awesome experience on social media, and the guests patiently waiting in the queue advance at the expected pace for their turn.

Show control is a key factor in making today's high-end attractions perform reliably and keeping a property competitive. Use the right equipment combined with industry-standard communication and control methods, and you will be well prepared to take on even the most advanced ride systems to create a robust attraction and a great guest experience. You'll be on your way towards making your next ride project the best of the best. • • •



As Chief Innovation Officer at Alcorn McBride, Scott Harkless (scott@alcorn.com) works closely with clients to determine their biggest areas of need and leads a team of problem solvers to come up with creative solutions. He draws upon experience in product development, system commissioning, client training, marketing, and sales.



Photos courtesy IAAPA

IAAPA Expo Asia

A look at IAAPA and industry growth in the Asia Pacific region

interviews by Martin Palicki

InPark connected with June Ko, executive director and VP, APAC region operations for IAAPA, to discuss growth in the region and the association, how IAAPA serves the Asia Pacific sector and what to expect at the IAAPA Expo Asia (June 11-14, 2019).

IAAPA now has two offices in Asia: Hong Kong and now Shanghai. Why was it the right time for an additional office?

IAAPA is the global association for the attractions industry and it is important for us to have offices in the regions where members – and potential members – operate. Asia Pacific is the fastest growing region for the attractions industry, and we knew it was time to open an office in China to help support and serve that growth.

Establishing a presence in both Hong Kong and Shanghai ensures we can continue to serve global industry professionals and the overall growth of the industry itself. Our teams help facilitate new connections through networking and educational events around the region and continue to strengthen safety harmonization through international standards.

The new Shanghai office also helps us better communicate with industry professionals in China. For instance, we now have an IAAPA WeChat channel, which is exclusive to China, and is in

Chinese. This tool is the right way for us to better reach and serve industry professionals around the country.

You have new staff on your APAC team. Who will be meeting with attendees during the IAAPA Expo Asia?

Our team is:

- June Ko – Executive Director and VP – APAC Region Operations
- Chris Lo – Director Exhibitions, Conferences and Sales
- Cyrus Cheung – Sales Representative, Expo
- Coby Liu – Manager, Education and Events
- Zenia Choy – Senior Manager, Expo Operations
- Ceylon Chan – Membership Executive
- Joey Zhang – Manager, China Office

The IAAPA team in the Asia Pacific region (APAC) continues to grow. Our dedicated team, located across two offices, continues to learn and understand the unique needs of members and the

聚焦亚太地区IAAPA与行业发展 (选录)

采访：Martin Palicki

对话June Ko —— InPark与IAAPA执行总监和副总裁、亚太地区营运负责人June Ko，就该地区协会的发展，IAAPA如何为亚太地区服务以及IAAPA亚洲博览会值得期待的内容等进行了讨论。

IAAPA目前在亚洲设有两个办事处：香港和现在的上海。为什么此前是增设上海办事处的好时机？

IAAPA是景点行业的全球协会组织，对我们来说，在有会员和潜在会员营运区域开设办事处尤为重要。亚太地区是景点行业发展最快的地区，所以我们知道是时候在中国增设办事处，为在亚太地区的成长和发展提供支持和服务。

在香港和上海设立办事处，确保我们能继续为全球业内专家及行业总体发展服务。通过网络和教育活动的开展，在促进区域内新连接建立的同时，我们还将继续通过国际标准加强安全协调。

你们一直在为会员组织一系列区域活动，现在有什么计划，进展如何？

这一年里，聚焦该地区和时区，我们的团队开展了网络研讨会和在线课程。我们为众多业内部门和顾客举办了多次网络活动，包括家庭娱乐中心，水上乐园等。IAAPA致力于为行业需求提供支持并与其共同成长；亚太地区团队将继续开发更多方式来满足行业需求。

在为地方层面提供支持的同时，IAAPA将继续为全球景点行业提供服务。

值得关注的2019大事件：

- IAAPA景点管理学院 - 7月14-18日，菲律宾马尼拉
- 亚太峰会 - 10月15-17日，海南
- 遇见IAAPA - 10月31日，香港特别行政区
- IAAPA景点管理学院 - 12月，新加坡

近几年的展会有什么值得期待的教育方式？

IAAPA亚洲博览会的教育课程是我们有史以来最强的。每个课程均由亚太教育小组委员会精心挑选。该小组委员会是关注行业继续教育 and 发展的业内专家。



June Ko

Shaun McKeough与IAAPA亚太团队合作，带领亚太教育小组委员会，一起开办多场会议，从故事讲述和市场营销，到媒体和市场趋势，再到安全和营运。

除教育会议外，还将前往数个上海最受欢迎的旅游目的地实地考察，展开独家教育考察游。

请与我们分享一下上海IAAPA亚洲博览会的一些亮点。

今年的IAAPA亚洲博览会将重返上海，对此我们非常激动。除了IAAPA景点管理学院和IAAPA安全学院，我们增加了更多的交流机会和教育会议，以及学生和年轻业内人士了解该行业的新机会。这反映出IAAPA亚洲博览会已成为亚洲景点行业必须参加的活动，与会者来自60多个国家。

几个关键活动：

- 营运商招待会将吸引业内主要买家（6月13日，晚上6:00-8:00）
- IAAPA职业活动，免费对大学生开放，提供同业界领袖与经验丰富人士交流和学习的机会
- 参展商奖，为杰出的展位设计和展览进行表彰
- 教育课程已延长至4天
- 业界领袖早餐会，与上海迪士尼度假区董事长兼总经理Joe Schott共进早餐将是早餐会的亮点
- 上海海昌海洋公园开幕晚宴不容错过 . . .

industry — not only here in Asia Pacific — but also the trends and issues facing the entire global industry. We look forward to seeing everyone at IAAPA Asia Expo in Shanghai and continuing to serve members throughout the region.

You've been creating a series of regional events for members. What are you planning and how has it been going?

Throughout the year, our team conducts webinars and online courses focused on the region and in the time zone. Our networking events represent the many sectors and constituencies in the industry, including family entertainment centers (FECs), waterparks, and more. IAAPA is dedicated to supporting and growing with the needs of the industry, and the APAC team continues to develop additional ways to meet those needs.

IAAPA remains focused on serving the industry around the world while supporting it at the local level. Regional, in-person events are a key part of this strategy, bringing people together to share best practices, learn trends, and understand issues facing our industry. We remain focused on supporting international safety standards harmonization and adoption and will continue to meet in person with key representatives in China, South Korea, Australia, Philippines, Indonesia, Thailand, and more.

Some upcoming 2019 events to note:

- IAAPA Institute for Attractions Managers – 14-18 July, Manila, Philippines
- Asia Pacific Summit - 15-17 October, Hainan
- Meet IAAPA – 31 October, Hong Kong SAR
- IAAPA Institute for Attractions Managers – December, Singapore

What sort of education tracks can people expect at this year's show?

The Education program at IAAPA Asia Expo is our strongest ever. Each program has been selected and sourced from the Asia Pacific Education Subcommittee, who are industry professionals focused on the continued education and growth of the industry.

In collaboration with the IAAPA Asia Pacific team, Shaun McKeough leads the Asia Pacific Education Subcommittee; together they will provide sessions on everything from storytelling and marketing to media and market trends to safety and operations. The committee will also host and moderate the Human Resources Learning Lab on 13 June from 4-5 p.m.

Counterprogramming in Shanghai: Taylor Jeffs talks about Haichang Ocean Park



The 2019 IAAPA Asia Expo opening night reception takes place at Shanghai Haichang Ocean Park (SHOP). Since its opening in November 2018, the park has brought its theme of "Love as a Happy Ocean Journey" to thousands of guests. We asked Taylor Jeffs, president and chief creative officer

at Legacy Entertainment to tell us more about the park. Legacy was responsible for concept design, master planning and schematic design.

Theme park competition in Shanghai is pretty intense; how did your firm design to win the bid?

China's theme park landscape completely transforms every few years, and nowhere is this more pronounced than in Shanghai. Not only is Shanghai Haichang Ocean Park the nearest competition (geographically) to Shanghai Disneyland, China's highest-profile theme park, but it also had to be realized for about 15% of Disney's budget. Because of this, working with our partners at Haichang we made a concentrated effort to counterprogram Disney's offerings, with a robust attraction mix that balances family attractions and thrill rides with the signature marine life exhibits.

How has this project built on other parks/attractions the company has designed?

This project allowed us to combine and make the most of two of our core skillsets - theme parks and aquariums – within a single property. Beginning with the Georgia Aquarium in 2005, we have been very fortunate to collaborate on some of the world's top marine life projects, including the Kingdom of Poseidon in Harbin and Chimelong's Marine Life Science Center opening later this year. This is an industry in a particularly dramatic state of change, and we feel a responsibility to help steer it in the right direction.

How is SHOP differentiated from other marine themed parks?

In many ways, first generation marine parks are often saddled with infrastructure dating back to the 1970s and '80s, which can take years or decades to phase out or upgrade. In Shanghai, we had the luxury of building from the ground up, meaning we could take advantage of all the latest and most exciting trends in animal husbandry. This is represented in the front of house with fantastical acrylic displays, as well as in the back of house with state-of-the-art life support systems. In particular, the Penguin and Otter displays are top-of-the-line.

In addition to the education sessions, exclusive EDUTours include site tours to several of Shanghai's most popular destinations.

Where do you see market growth and opportunity in the Asia Pacific region?

The Asia Pacific region is extremely diverse and is growing and expanding in every business category. IAAPA's Annual Global Outlook Reports projects attendance at attractions facilities in Asia-Pacific will grow 4.8% over the next five years and spending will increase by 7.1%.

China will continue to be the primary driver of this growth, with the attractions industry in South Korea, Singapore, and the Philippines continuing to expand.

Tell us some highlights of IAAPA Expo Asia in Shanghai.

We are excited IAAPA Expo Asia is returning to Shanghai this year. We have added more networking opportunities and education sessions, and new opportunities for students and young professionals to learn about the industry, in addition to the IAAPA Institute for Attractions Managers, and the IAAPA Safety Institute. This reflects that IAAPA Expo Asia has become the must-attend event for the attractions industry in Asia, with

attendees from more than 60 countries.

A few key events:

- The Operators' Reception will engage key buyers in the industry
- IAAPA Career Slam, free for university students, provides the opportunity to network and learn from industry leaders and veterans
- Exhibitor Awards will celebrate outstanding booth design and displays.
- The Education program has been extended to four days
- The Leadership Breakfast featuring Joe Schott, President and General Manager, Shanghai Disney Resort will also be a highlight.
- The Opening Night Reception at Shanghai Haichang Ocean Park [see sidebar] should not be missed. •••



June Ko



That roller coaster! It covers a lot of ground and is very prominent. Why did you opt to integrate that ride into the park that way?

Integration is something our team at Legacy really prides itself on. We think it's extremely important to take a design approach that integrates the park with its attractions, just as you would integrate the soundtrack of a movie. Attractions such as Intamin's Steel Dolphin coaster, and WhiteWater's Fire Falls rapids ride tie in seamlessly with their environments, and as such they bring a substantial level of energy and life to their respective areas of the park.

What story is the park telling?

The park has two main zones that are 'polar opposites' of one another. One is a high-tech tropical paradise home to the park's warm water creatures, while on the opposite side of the park is an ancient European-style sea port home to the cold water residents. We strove to achieve an organization of attractions and exhibits that was both intuitive and methodical.

What would you most recommend to your industry colleagues who will be visiting the park for the first time during IAAPA Expo Asia?

There are too many to name, but if I had to narrow it down I would start with the Cable Car aerial skyway, which offers spectacular panoramic bird's-eye views of the entire park, and has also developed into a great focal point for the park's social media presence. Second is the Fire Falls rapids ride - which we understand to be the world's longest - as well as the first ever to incorporate waterslide-style elements such as the Manta curve. We're also extremely proud of the park's indoor Dolphin Theater and think it ranks among the best anywhere. And we hope that our colleagues will make a point of visiting the Jellyfish & Coral pavilion, only because it's really cool. • *Photos courtesy Legacy Entertainment.*

连线上海： Taylor Jeffs谈海昌海洋公园

2019 IAAPA亚洲博览会开幕晚宴将在上海海昌海洋公园举行。我们邀请了Legacy Entertainment的董事长兼首席创意官Taylor Jeffs为我们进一步介绍该公园。Legacy此前负责该公园的概念设计、总体规划和方案设计。

上海主题公园的竞争相当激烈，贵公司是如何设计且中标的？

中国主题公园的情况每几年就会发生翻天覆地的变化，其中上海的表现尤为突出。上海海昌海洋公园不仅是最接近中国最受瞩目的主题公园——上海迪士尼（地理位置方面来说）的竞争对手，而其预算仅约为迪士尼的15%。正因如此，我们和海昌团队一起，倾注了大量的心血，设计出与迪士尼截然不同的体验。这里有在家庭景点和刺激游乐设施之间取平衡的强大的融合景点，和其特有的海洋生物展。

该公园为我们讲述了一个什么故事？

公园有两个主要区域，但泾渭分明。一个为暖水区生物的高科技热带天堂之家，另一个则是冷水区居民古老的欧式海港之家。



过山车地面覆盖范围很广，非常突出。为什么会选择用这样的方式将游乐设施融入公园呢？

整合是我们Legacy团队真正引以为傲的能力。我们认为采用使景点与公园浑然一体的设计方法尤为重要，类似为电影配乐一样。如Intamin的海豚过山车和白水公司的火山漂流等景点，都与周围的环境无缝连接。也正因如此，他们为公园相应的区域注入了充沛的活力和生机。

你们设计过的其他公园、景点的经历为本项目提供了哪些经验？

本项目使我们得以在单物业内结合并且充分发挥我们的两大核心技能组——主题公园和水族馆。自2005年的乔治亚水族馆起，我们很幸运可以参与多个全球顶级的海洋生物项目合作。

对于在本次IAAPA亚洲博览会里即将首次参观该公园的同行，有什么最想推荐的吗？

有太多值得推荐，但我不得不缩小范围。毋庸置疑，首先我会推荐时空缆车，他们将看到壮观的园区全景鸟瞰图。其次是火山漂流，众所周知，这是世界上最长的首个结合水滑道风格元素的游乐设备。

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Sounds in the wild

Two Ohio zoos implement the latest audio technologies

by Joe Kleiman

As zoos continue to transform to more robust environments themed to specific geography (the Amazon, the Congo) or broader biomes (rain forests), they are also employing tools of themed entertainment design, such as modern sound systems, to provide a more robust visitor experience.

Two Ohio properties – Columbus Zoo and Aquarium, and Cincinnati Zoo & Botanical Garden - recently upgraded their audio systems with state-of-the-art, networked installations spanning large outdoor areas.

Today, a single audio system can be powerful and versatile enough to perform a number of important duties across a zoo's property, such as providing ambient sound and background music as well as dispatching zoned or parkwide public announcements that are a necessary part of the public safety objective. Such a system also supports program expansion such as festivals and holiday events, which both the Columbus and Cincinnati facilities have turned to their benefit.

Columbus - Dante Connects

The Columbus Zoo and Aquarium sits on 580 acres on the shore of the Scioto River. With annual attendance of more than 2.3 million, the zoo's property is split into three distinct zones – a golf course, the Zoombezi Bay waterpark, and the zoo proper, which houses over 10,000 animals. As the property expanded over the years, zoo staff discovered that the different

independent audio systems it had installed to control ambient audio and public announcements were insufficiently integrated. According to Kevin Bonifas, Director of Technology Services, "We decided to bring it all together into a single platform. We looked at a number of different options..."

Christopher Dittman, the Zoo's Audiovisual Administrator, recommended the zoo implement the Dante media networking solution from Audinate. Dittman is a Certified Technology Specialist by AVIXA, the professional audiovisual integrator association that organizes the InfoComm and ISE shows.

In June 2015, Zoo executives discussed their needs with Audinate staff during the annual InfoComm show in Orlando. It turned out, serendipitously, that Audinate CEO Lee Ellison hails from the Columbus area. The project was funded in 2016, with implementation beginning in 2017. Additional integration took place in 2018, primarily with the waterpark, where the public announcement system is critical for moments of inclement weather, and the golf course, where the audio system is used in the events pavilion.

One of the advantages of Dante is that the solution is integrated into products from hundreds of manufacturers. However, this presents the issue of how to monitor and control those various components. Working with Ed Walters of Holland, Michigan-based The Solution LLC, Dittman brought in Audinate's single

system control platform, Dante Domain Manager, with the Zoo acting as a beta site for Domain Manager's integration with the Dante system. Dittman says, "Walters works primarily with educational venues, so he understood the needs of the Zoo."

The system has a variety of uses throughout the property, including ambient music, parkwide public announcements, the annual holiday light show, and keeper talks.

Within the zoo itself, the system provides music within some exhibit areas, helping



The Wild Africa show in the Heart of Africa area of The Columbus Zoo. Photo courtesy The Columbus Zoo.

to transition the viewing experience from being a passive one to a more immersive environment. According to Dittman, “In some areas, we added speakers to maximize the enjoyment for shows. One of the key areas that features the new sound system is Heart of Africa, a 43-acre region that is split between an African village and a fictional African National Park. Within the village, visitors hear drumming and the sound of a busy marketplace.

Moving forward, Dante will also be integrated in new exhibits, such as Adventure Cove, a seven-acre seal and sea lion habitat opening in 2020.

Cincinnati - Wireless Devas

The Cincinnati Zoo & Botanical Garden has implemented Powersoft’s DEVA technology. DEVA is a networked multimedia system comprised of egg-shaped units, each capable of a variety of applications. According to Dutch Mulholland, the Zoo’s Director of IT/Audio Engineering, “I first came across DEVA when visiting the Powersoft booth at InfoComm. A few years later, I went back and was impressed with what they had done with the system. We decided to implement two DEVA units for a year as a test and were so impressed that when it came time for our annual Festival of Lights, we brought that number up to 50.”

Unlike the wired network option selected by the Columbus Zoo, the DEVA system at Cincinnati is fully wireless. “It resolved a number of issues we had,” says Mulholland, “including squirrels chewing through our cables.”

The DEVA system provides ambient audio and music throughout the facility, with the ability to create specific audio zones and for audio to trail from one DEVA unit to the next without lag, something Mulholland points out exists within most wired networks.

The system also becomes a public announcement system where all zoo visitors can be notified at once in case of an emergency, an important consideration following recent events at the Zoo.

Zoo lights and remote access

A big trend within the zoological park community is holding an annual holiday light festival to extend the season and give the public a different way to experience the property. In Columbus, it’s known as Wildlights. In Cincinnati, it’s the Festival of Lights. At both zoos, the new audio networking systems play major roles in the festivities.

According to Columbus Zoo’s Bonifas, “Dante controls the audio, while a separate show controller handles the lights. The two are synched together, which results in a fantastic show.”

In Cincinnati, Mulholland likes the fact that DEVA volume can be controlled by zone or even by individual speaker with the stroke of a finger. In the past, when the Zoo has held its Christmas tree lighting ceremony, a phone call needed to be made to a control room for speakers to be shut off. The DEVA system can be managed remotely from a tablet or smartphone



Santa greets guests during Festival of Lights at The Cincinnati Zoo.
Photo courtesy The Cincinnati Zoo.

over the Zoo’s wifi network. Now, when the lighting ceremony commences, all it takes is a swipe of the fingers on the spot to silence individual or groups of DEVA units.

Likewise, Dante Domain Manager at the Columbus Zoo features a wireless functionality for control, enabling remote access through handheld platforms. Bonifas points out, “We have a centralized control room, but our staff is always on the move, so that remote access is very important. We have a lot of tablets, especially Microsoft Surface, that are integrated with the system.”

One key aspect of Dante and Dante Domain Manager that Bonifas likes is its variability. “Our attendance fluctuates throughout the year, so it’s good to be able to easily increase or decrease the audio levels based on crowd size.”

Cincinnati currently has over one hundred active and passive DEVA units in place. The next step for the system’s implementation at the Zoo is the installation of HD video units, capable of shooting video and photos at 1080p. These will be used to monitor potential visitor intrusion. The DEVA unit can be programmed to automatically recognize a trespass and give an audible warning, while at the same time transmitting images to the park’s security officers.

Choosing the best solution

Each of the two solutions offers a unique approach. Columbus Zoo’s wired Dante network helped unite a large property with many open areas. The Dante solution being enabled in products from more than 100 manufacturers also empowers the zoo to utilize those components best suited to its needs, such as the BOSE speakers that make up 90% of the Zoo’s overall speakers.

In contrast, Cincinnati’s choice of DEVA achieves versatility via the system’s infrastructure, which provides a myriad of services including easy control and volume access on individual and zoned speakers, wireless connectivity, and multiple ways of providing public safety. • • •

See “The Zoovolution” (InPark Issue #76) for more on the Cincinnati Zoo and a complete list of InPark’s coverage of zoos and aquariums.



Christie's MicroTiles LED display at ISE 2019 Photo by Martin Palicki

Everything is under octrol

New Christie MicroTiles LED attract attention

by Judith Rubin

In the first half of 2019, new Christie® MicroTiles® LED have been enthusiastically received at trade events – including ISE, NAB and open houses across Europe and North America. At this writing MicroTiles LED were also heading for the AAM Museum Expo in New Orleans (to be displayed in the Ideum booth) and the InfoComm Show in Orlando, with plans for additional exhibits at theme park trade events later in the year. The product was recognized as best overall new product at ISE by rAve Publications and is currently a finalist for an AV Technology Award as Display Product of the Year; orders are being taken now and mass production commences in September.

As modular, programmable, mountable digital display units, MicroTiles were a dramatic game changer technology when

originally launched in 2009. MicroTiles inspired the re-imagining of digital displays by designers, architects and media producers, who explored their creative potential to reach audiences in world's fair pavilions, museums, casinos, corporate spaces, retail, broadcast and more. Bob Rushby and Mike Perkins, co-inventors of the original MicroTiles, referred to them as “visual building blocks... pixels as a building material – making display elements an integral part of a space.”

Ten years later, MicroTiles LED are presented as delivering everything that made the first iteration a hit and more, with the vividness of LED display and various features and upgrades that expand the creative possibilities. New MicroTiles LED also have built-in features and compatibilities that support simpler

installation, integration, maintenance and operations. They are more conducive to non-traditional shapes and configurations, and more eligible to use in visitor attractions.

With attractions in mind, we spoke to Christie's Ted Romanowitz (Senior Product Manager), Bryan Boehme (Executive Director, Global Sales and Business Development, Entertainment at Christie Digital Systems) and Martin Waverley (Senior Manager for the Americas, Technical Solutions Group) about features and benefits of MicroTiles LED.

For a deep dive into technical specs and other features of MicroTiles LED, visit microtiles.com

High-end shape shifting

"There's a reason they're called 'MicroTiles,' said Martin Waverley. "They are very small, 9 inches by about 10.5 inches, significantly smaller (about ¼ the size) than the competition. The beauty of that is the ability to create more interesting shapes, tighter radiuses. They can wrap around corners (with a 5mm edge gap); they can do tight-radius concave or convex curves.. They can wrap the inside and the outside of a surface."

The ability to assume multiple form factors and deliver high-end media suggests many creative possibilities for MicroTiles LED in themed entertainment, rides, museums, cruise ships, hospitality and more. Bryan Boehme said, "This technology is excellent for providing something quick and dramatic - also for futuristic displays and sets, and details such as control panels for space ships. In queue lines and preshow spaces, a MicroTiles LED display can help hold people's attention and show them something interesting before they enter the main attraction. It can



Ted Romanowitz prepares for a press interview during ISE 2019.

also provide a powerful Pepper's Ghost effect; we think it will be immediately applied, for instance in dark rides or other attractions where guests get up close to the image."

In addition to their ability to form inside and outside corners and angles, their ability to form shapes and curves, convex or concave, without detectable seams or shadows, suggests many possibilities. "You can overlap tiles, you can stack them – it's almost unlimited," said Boehme. "You can put content on every surface; any structure can be a media surface. They're competitive with compound curved screens."

Media and canvas become one

What kind of media can you put on MicroTiles LED for visitor attractions? According to Christie's experts, just what you might need.

The picture becomes quite holistic – all the features and factors are interdependent. "We're all about providing a complete system that delivers an experience: manageability, serviceability, interface to the wall, how you interact with it, and more," said Romanowitz.

Romanowitz continued, "MicroTiles LED are what theme park customers want and need for dark rides in terms of visual performance, supporting full motion video, broad color spectrum and broad viewing angle sans latency and artifacts." He touts "P3 color space with 97% uniformity, up to 12 bit content, 4:4:4 chroma subsampling, 4K input capacity and refresh rate of 120Hz. And whatever you put in our control system goes directly to the pixel, uncompressed. There is a 40 gigabit connection between the controller and the wall."

Martin Waverley said, "Media producers have been enthralled to see the color that can be delivered by MicroTiles LED: as good as or better than cinema P3 DCI color today. The high refresh rate of 120Hz allows you to pan the camera very quickly without losing clarity or crispness. That is complemented by the P3 color space and 12 bit color depth to give producers many options and great freedom to create content that will play back just as desired."

Boehme said, "The expanded color space plus the ability to shape the canvas itself is a powerful creative combination, and



The cabinet-free, magnetic LED tiles are designed to eliminate alignment requirements and dramatically increase installation speed. Unless otherwise noted, all photos courtesy of Christie.



MicroTiles LED can be accessed easily for maintenance or repair.

producers can rely on built-in upscaling and downscaling (16x and 20x, respectively) to support unusual configurations. Before, if you wanted 1080p the wall had to get that exact size in pixels. Now, if you send us a weird shape we can help you scale it without having to add a new processor.”

“The possibilities go well beyond the physicality of creating shapes,” said Romanowitz. “Producers will be pleased to know that MicroTiles LED have built-in compatibility with the Christie family of support products, such as Pandoras Box, Terra SDVoE AV-over-IP networking solutions and Christie Spyder X80. With those combined resources you can create a dimensional canvas, map the content, share any content anywhere, and make an amazing, dramatic experience.”

Waverley emphasized that MicroTiles LED work with gesture interactive systems. “The system can be configured to work with all the interactive stuff out there such as facial recognition, and this has really resonated with our partners in theme parks, museums, and public exhibitions.”

Boehme pointed out that using MicroTiles LED doesn’t require creating new content, and that existing content can be repurposed quite effectively given the wide range of display options and built-in tools. “With Christie Terra you can take any source, any camera or format, and distribute it over the network, bringing it into the MicroTiles LED controller. There’s broad compatibility.”

Install, integration and “octrol”

A primary upgrade that MicroTiles LED boast is the proprietary, “click and go” quick mount system. “It has cut the install time in half, which also represents a cost saving,” said Romanowitz. “And as they say in the movie industry, ‘that lets you put more of your money on the screen.’”

Waverley drew a different cinematic parallel. “It’s like the movie ‘Armageddon,’ when Bruce Willis goes in the spaceship and starts throwing out unnecessary technology. A metal sheet goes on the wall and auto aligns; the chassis magnetizes to the sheet. There are no cables, just one Cat5 to each tile, and that includes power. The normal lead time now is about 10 weeks for the LED tiles and electronic components; the sheet and chassis can be provided in advance, 4-6 weeks out.”

Romanowitz invoked “perfect planarity” facilitated by precision manufacturing: “Once you get the mounting structure on the wall, no x y or z adjustment is needed. The wall adjusters have 20mm of adjustability and the direct mount system will work in any fixed installation.” The thinness of the mount keeps the total installation depth within the four-inch allowance required for ADA compliance.

“In addition to the simplicity and speed of installation, the system can be managed remotely, and doesn’t require a dedicated console, which supports themed entertainment applications,” said Boehme. “Control is via HTML5 based browser, meaning that you can run it and receive alerts on your device from anywhere on the property or in the world. This supports minimal downtime and is one of the features that provide redundancy.”

The ability to locate support equipment at some distance from the display is another boon for visitor attractions. “You can



Bryan Boehme explains MicroTiles LED to a customer while next to the display at ISE 2019.

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remote the power up to 100 meters away,” said Waverley. “You can remote the video signals, with integrated fiber extenders, and you can locate the LED controllers up to six miles away. You can have your own cloud. All this supports a smaller footprint for the actual attraction and keeps the actual maintenance away from the ride building.”

Enter the “octroller,” a key component. Said Waverley: “Given that your power can be remoted, instead of all receivers and power supply with the display, you put in place the octroller, so named because one octroller feeds 8 tiles (24 modules). You have to get electrical involved with the installation, but by doing so, you are keeping all that equipment heat out of the room, and the power supplies are redundant, telecom grade and hot swappable, which supports 24/7 uptime.”

The gestalt

MicroTiles LED have something like a group consciousness. “From time to time LEDs go bad,” said Romanowitz. “With Christie’s patented system you can remove any module board from anywhere on the wall and replace it, and the new module will match to the rest once initialized into the system.” A related feature supporting uniformity is auto-calibration. Over time, variations can happen in color and brightness. “They are camera-calibrated in the manufacturing process, but once installed, they can auto-calibrate themselves without a camera,” said Romanowitz.

“The system uses built-in sensors to monitor itself constantly, so that each piece knows what the other one is doing, knows every setting,” said Waverley. “Because the tiles talk to each other, if you have multiple attractions using the tiles, you can swap them out one to the other, and even put your spares to work as a wall.”

“They learn from each other,” said Boehme.

Made in Kitchener

The field is more crowded with AV solutions today than it was a decade ago. Christie sees one of the important differentiators for MicroTiles LED and other proprietary product lines is that they are manufactured by Christie, for Christie, under Christie control in its Kitchener, Ontario location.

Another key, general point is partnership with clients and the industry. “We listen to our customers and incorporate what we learn in the design and engineering of our product,” said Boehme. “With Christie MicroTiles LED, we’ve given them a digital canvas they can use in a multitude of ways with fewer constraints than ever before, to share messages and create great guest experiences. We are very excited to see the creative output and unexpected, pioneering concepts and projects that will emerge.” • • •



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Coasting around Asia

Jason Pan of Vekoma discusses the latest theme park trends in Asia

interview by Martin Palicki

Netherlands-based Vekoma has more than 20 new attractions opening around the world in 2019, many in Asia. As a respected name in roller coaster manufacturing, Vekoma has built attractions for a wide array of clients, including Disney. InPark spoke to Jason Pan, Vekoma's regional director of sales and marketing about how roller coasters and thrill rides are faring in the dynamic Asian theme park market.

Vekoma is opening numerous projects in China over the next few years. Do you think the theme park industry in China has reached a peak stage of development?

Since the opening of Shanghai Disneyland in 2016, more investors have stepped into this market and we see a growing number of Chinese theme park companies ranking in the top 10 according to the TEA/AECOM Theme Index attendance reports.

New parks are being built and as we all know, it takes a considerable amount of time to build a park, so we believe it is still not the peak of Chinese park developments. We will see more park openings in the coming two years. It's also important to note that after these years of rapid growth and development, the Chinese market has also become more mature and oriented toward high quality.

Much has been written about how Asian consumers generally prefer less intense rides than Western consumers. As a roller coaster manufacturer, do you find that to be true?

Of course there are cultural differences in Asia but "fun is fun" wherever you are in the world. We have found that Asian consumers like thrill rides a lot, however, the large population in Asia is also very family oriented and therefore rides that the entire family can enjoy are also very popular. To the Asian consumer it does not really matter whether it is a thrill or family coaster. They



Vekoma's Family Boomerang Racer. Photo courtesy Vekoma



Jason Pan

care more about having a fun experience. Park owners realize this and we see them opting for a mix of family and thrill coasters.

In terms of ride features, how important is bigger/taller/faster to the Asian markets?

At the beginning, we did see some investors focusing more on bigger, taller or faster, however as the market is maturing, parks now focus more on the guest experiences. A new attraction requires a substantial investment so investors will choose those attractions that have a longer lifetime while at the same time being attractive to a range of audiences.

You can see there is a lot of good IP entering into the Chinese market, and combining it with rides allows parks to build more immersive attractions. Storytelling and immersive experiences are the most popular trends in China right now.

How important are roller coasters to new park developments in Asia?

Coasters have always been a main attraction for parks, no matter whether they are - in Europe/EMEA, USA/North America or Asia. Because of their big scale and visibility, they entice people into a park and get them involved in the whole park environment.

What are some of the things an operator should consider in regard to buying and operating a roller coaster?

When operating and buying a coaster, the ride experience is not the only important element that an operator must consider. Safety is the first priority, and safety is closely connected to maintenance. The client should make sure that the coaster will be easy to operate and maintain and look for options that include strong after-sales support. •••

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